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ANNUAL REPORT  
OF THE  
SURGEON GENERAL OF THE  
PUBLIC HEALTH SERVICE  
OF THE UNITED STATES

FOR THE FISCAL YEAR

1924



WASHINGTON  
GOVERNMENT PRINTING OFFICE  
1924

TREASURY DEPARTMENT

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*Public Health Service*

Letter of Transmittal

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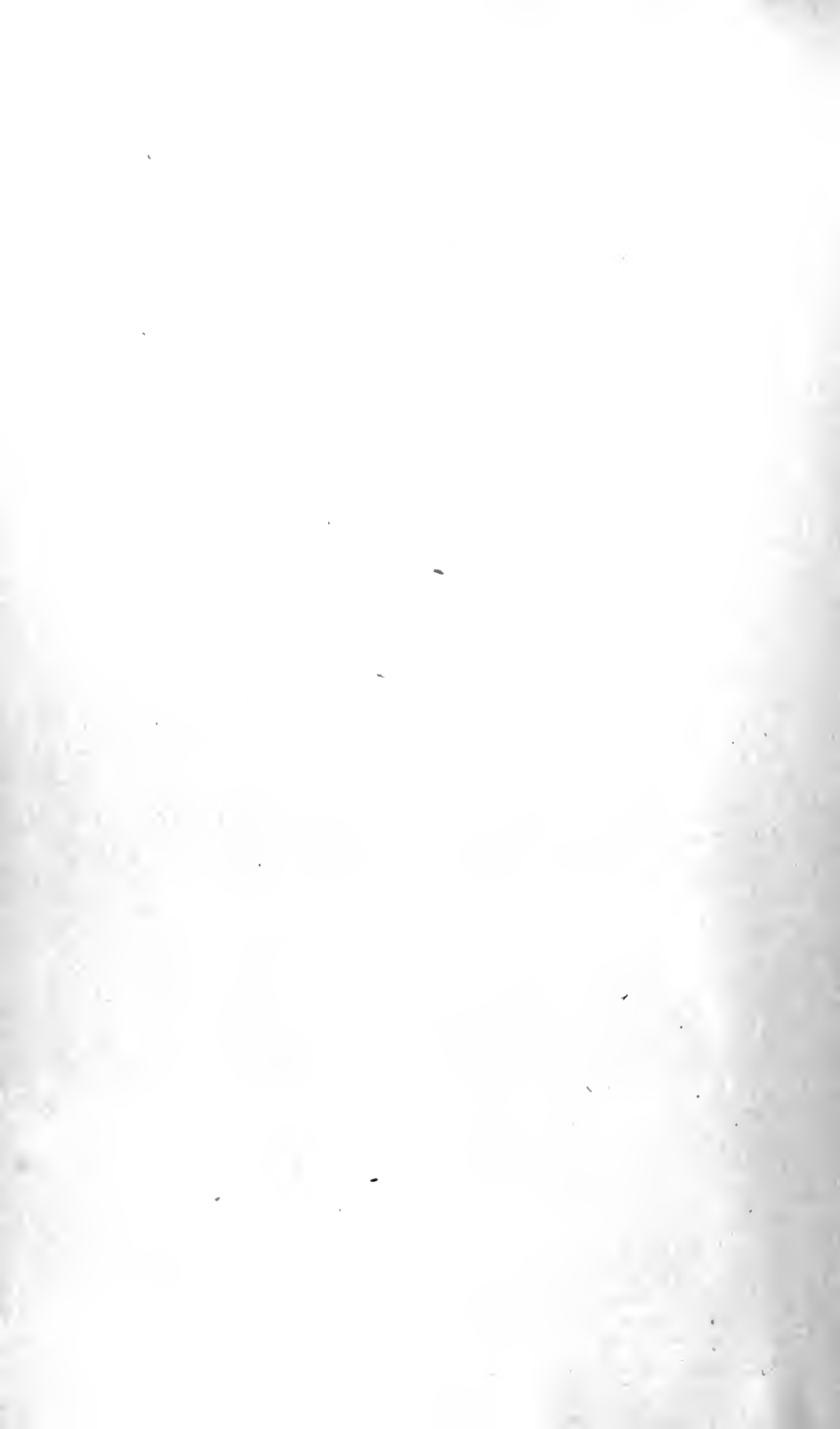
TREASURY DEPARTMENT,  
OFFICE OF THE SECRETARY,  
*Washington, December 1, 1924.*

SIR: In accordance with section 9 of the act of Congress approved July 1, 1902, I have the honor to transmit herewith the report of the Surgeon General of the Public Health Service for the fiscal year 1924.

Respectfully,

A. W. MELLON,  
*Secretary of the Treasury.*

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.



# CONTENTS

	Page
Foreword.....	1
Division of Scientific Research.....	11
Cancer.....	12
Clonorchiasis.....	12
Food poisoning.....	13
Goiter.....	13
Influenza.....	14
Malaria.....	16
Pellagra.....	21
Rocky Mountain spotted fever.....	23
Typhus fever.....	24
Industrial hygiene and sanitation.....	24
Public health administration studies.....	32
Cooperation with the Johns Hopkins University, School of Hygiene and Public Health, in epidemiological study of diphtheria.....	34
Milk investigations.....	35
Child hygiene.....	37
Mental hygiene.....	42
Statistical office.....	43
Stream pollution.....	48
Excreta-disposal studies.....	52
Leprosy investigation station, Honolulu, Hawaii.....	52
Hygienic laboratory.....	54
Viruses, serums, toxins, and analogous products.....	64
Miscellaneous.....	64
Division of Domestic (Interstate) Quarantine.....	65
Plague-suppressive measures.....	65
San Francisco, Calif.....	65
Seattle, Wash.....	69
Rodent surveys, New England and North Atlantic States.....	70
Trachoma-eradication work.....	70
Advisory committee on the education of sanitarians.....	75
Supervision of common carriers' water supplies.....	77
Interstate railroad water supplies.....	78
Interstate vessel water supplies.....	79
Interstate sanitary districts.....	80
Rural health work.....	100
Mosquito control on Texas-Mexican border.....	101
Smallpox outbreak in Detroit, Mich.....	110
Supervision of interstate travel of diseased persons.....	110
Sanitary inspection of Government buildings.....	110
Division of Foreign and Insular Quarantine and Immigration.....	111
Quarantine transactions.....	111
General prevalence of quarantinable diseases.....	111
Changes in quarantine procedure.....	111
Violation of quarantine laws.....	113
Transactions at national quarantine stations.....	114
Transactions at insular quarantine stations.....	141
Transactions at foreign ports.....	156
Summary of quarantine transactions.....	166
Medical inspection of aliens.....	166
Reports from immigration stations.....	173
Division of Sanitary Reports and Statistics.....	190
Morbidity reports.....	190
Collaborating and assistant collaborating epidemiologists.....	190
State morbidity reports.....	191
Weekly telegraphic reports.....	192
Monthly State reports.....	192
Annual reports.....	193
City reports.....	193
Foreign reports.....	195
Prevalence of disease.....	195
Sanitary legislation.....	197
Publications issued by the division.....	197
Section of public health education.....	198

	Page.
Division of Marine Hospitals and Relief.....	200
Classes of beneficiaries.....	201
Beneficiaries and pay patients, United States Public Health Service.....	201
United States Employees' Compensation Commission.....	202
United States Coast Guard.....	203
United States Veterans' Bureau.....	204
United States Shipping Board.....	204
Medicinal liquors and drugs for vessels and miscellaneous functions.....	204
Operating costs in marine hospitals.....	205
Public Health Service supply depot at Perry Point, Md.....	206
Economies in the procurement of medical and hospital supplies.....	206
Supplies and equipment purchased.....	207
Contract hospitals.....	207
Physical examinations.....	210
Attending specialists.....	211
Roentgenology.....	211
Dentistry.....	211
Repairs and improvements.....	212
Examination and instruction of ships' officers in "First aid".....	212
Radio medical advice to ships at sea.....	213
Model ship's medicine chest.....	213
Special and representative marine hospitals.....	213
The nursing, dietetic, and reconstruction section.....	219
Division of Venereal Diseases.....	236
Federal and State appropriations.....	237
Reporting of venereal diseases.....	237
Treatment.....	239
Clinics.....	239
Correction and penal institutions.....	241
Distribution of arsphenamin.....	241
Medical instruction.....	242
Venereal disease information.....	242
Requests for medical advice.....	243
Field service.....	243
Community program.....	243
Work with the colored population.....	244
Social pathology.....	244
Work with schools.....	245
New publications.....	245
Pamphlets, film showings, lectures, exhibits.....	246
Interstate quarantine.....	248
State laws and regulations.....	248
Vice-repressive measures.....	249
Division of Personnel and Accounts.....	266
Public health districts.....	268
Commissioned medical officers.....	270
Reserve officers.....	271
Attending specialists.....	272
Acting assistant surgeons.....	272
Internes.....	273
Contract dental surgeons.....	273
Collaborating epidemiologists.....	273
Hygienic laboratory.....	273
Pharmacists and administrative assistants.....	274
Boards convened.....	274
Personnel statement.....	274
Financial statement.....	281
General inspection service.....	282
Chief clerk's office:	
Force on duty in the bureau.....	284
Buildings and office quarters.....	284
Public Health Service library.....	284
Improvements.....	285



# ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE

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TREASURY DEPARTMENT,  
BUREAU OF THE PUBLIC HEALTH SERVICE,  
*Washington, December 1, 1924.*

SIR: In accordance with the act approved July 1, 1902, I have the honor to submit, for transmission to Congress, the following report of the operations of the United States Public Health Service for the fiscal year ended June 30, 1924. This is the fifty-third annual report of this Service, covering the one hundred and twenty-sixth year of its existence.

Taking into consideration the many factors which influence the public health and the almost universal tendency toward a diminution of effort on the part of governmental health agencies, due to the necessity for economy in official business, it may be said that health conditions throughout the United States have generally been very satisfactory during the fiscal year just closed.

There was a material reduction in the number of deaths from diphtheria during the calendar year 1923 as compared with the previous year. In 1923, 45 States, having an aggregate population of approximately one hundred and nine millions, reported 12,339 deaths from diphtheria as against 14,684 deaths reported by 44 States in 1922, these States having a population of approximately one hundred and two millions. With improved methods there is no reason why diphtheria may not be still further greatly reduced if the people will avail themselves of the means of preventing this disease.

A very decided increase is noted in the incidence of measles. In 1923 the States mentioned reported 752,529 cases of this disease with 10,282 deaths as compared with 260,833 cases and 3,592 deaths in 1922. Measles still remains one of our grave menaces to childhood and is not without danger to those adults who escape contagion in early life.

Little change is seen with regard to scarlet fever, the death rate for 1923 being 3.3 per hundred thousand as against a rate of 3.2 per hundred thousand in 1922.

In 1922, 37 States reported 99,426 cases of whooping cough and 4,405 deaths, showing apparently that deaths from this disease occurred at the rate of 4.4 deaths for every 100 cases. In 1923, 44 States reported 164,318 cases and 8,999 deaths, or 5.5 deaths from whooping cough for each 100 cases of the disease. The data on deaths by age groups for 1922 and 1923 are not yet available, but of the deaths from whooping cough in the registration area during the five years 1917-1921, inclusive, over 53 per cent occurred in children under 1 year of age and more than 93 per cent in children under 5 years. These facts emphasize the great importance of keeping young children away from this disease if possible, as the chances of surviving an attack increase with the age of the child.

There was very little difference in the number of cases of smallpox for the two years, but there was a marked difference in the number of fatal cases of this disease. In 1923, 45 States reported a total of 30,771 cases of smallpox with 160 deaths, while in 1922, 41 States reported 30,247 cases of smallpox with 758 deaths. Severe outbreaks of this disease were threatened during the fiscal year, but were promptly controlled by isolation of cases and by vaccination, chiefly by the latter measure. The Public Health Service cooperated with States and local authorities in this work. A review of the number of cases of smallpox reported during the last five years shows very much better conditions in the New England States than in the West and Middle West. Three States—Massachusetts, Michigan, and California—may be taken as somewhat typical of this situation and are easily comparable, inasmuch as the populations of these three States are almost the same. In Massachusetts, during the five years ending December 31, 1923, there were reported 114 cases of smallpox. In Michigan, during the same period, there were reported 15,384 cases, while in California, during these five years, a total of 16,223 cases of smallpox were reported.

In my last annual report there were published diagrammatic representations of the decline of tuberculosis and typhoid fever in the original registration States of the United States from 1900 to 1921. Tuberculosis had dropped from 195.2 deaths per hundred thousand population in 1900 to 94.7 in 1921, while typhoid fever had declined from 31.3 in 1900 to 5.3 in 1921. The rates for 1922 were 92.3 and 3.9 per hundred thousand, respectively, indicating a continued decline for both diseases in the original registration States. Inasmuch as typhoid fever is largely a water-borne or milk-borne disease, its incidence is a fairly good index of the state of purity of the supplies of these two very important substances. It should be stated, however, that typhoid carriers, rather than contaminated water, have played an important rôle in milk-borne epidemics in recent years. The constantly increasing efficiency and extension of the pasteurization of milk is no doubt responsible in part for lowered rates in both typhoid fever and tuberculosis, particularly that type of tuberculosis which affects young children, often rendering them crippled and helpless for life.

The birth rates in 21 of the 27 States for which these data are available were lower in 1923 than in 1922, while the infant mortality rate was higher in 17 of these States. The highest birth rate (34.8 per thousand population) is shown for cities of Wyoming and the lowest (15.6) was found to be in the rural districts of Montana. The highest infant mortality rate for 1923 (117 per thousand infants under 1 year of age) appears for cities of South Carolina and the lowest (51) for the rural districts of Utah and the cities of Washington.

The general death rate was slightly higher in 1923 than in 1922 in 25 of 36 States for which data are available. The highest general death rate (20.3 per thousand population) is shown for cities in Mississippi and the lowest (6.5) for the rural districts of Idaho. The death rate from all causes for 30 States for which reports are available was 12.3 per thousand population in 1923 as against 11.9 for 1922.

It may be recalled that the average length of human life in the sixteenth century was estimated to be between 18 and 20 years; that at the close of the eighteenth century, it was still less than 25 years; and as late as 1900, it was between 45 and 48 years. Comparing with these figures the present average length of life of 56 years in the United States, and remembering that approximately 15 years have been added to the span of human life in the United States since 1870, and considering that in India at the present time, the average length of life still remains about 25 years, we can in some measure appreciate the importance of modern methods of preventing disease and of conserving health and life. It should be stated, however, that this marked improvement in conditions in the United States is by no means solely due to preventive measures directed against disease itself, but also to better economic and industrial conditions, matters which are to-day very properly occupying the attention of health departments of all civilized countries.

As stated in my annual report for 1922, all plague suppressive measures carried on by the Federal Government in States other than California were suspended at the close of that year on account of the absence of plague. I am pleased to report that there has been no occasion for the resumption of this work. It has been necessary to continue operations on a small scale in certain counties in California on account of plague in ground squirrels, and I have no doubt that, under present conditions, this squirrel infection will continue for many years to come. This reservoir of plague in the United States should ever be kept in mind, nor should our vigilance in maintaining squirrel-free zones around rat-infested cities in these infected counties be relaxed. One case of human plague, presumably infected in Monterey County, Calif., by ground squirrels, was reported during the fiscal year. There were also reported eight plague-infected ground squirrels found in San Luis Obispo County. These infected rodents by no means represent the extent of the infection still remaining in squirrel-infested territory.

There has been no importation of exotic disease during the year, if we may except a case or two of typhus fever that may have entered surreptitiously by way of our southern border. In the case of yellow fever, this is due in great measure to improved conditions in former endemic centers; and it is gratifying to note that with the aid of officers of this service stationed in those centers it has been possible, so far this year, to limit quarantine measures to inspection of passengers and to measures directed against mosquitoes, there having been no detention of passengers or vessels in quarantine as in former years. In the case of plague, cholera, smallpox, and typhus fever, it can, I believe, be stated in all fairness that the prevention of the importation of the troublesome diseases is due to the vigilance of the officers of this service, not alone those stationed as quarantine officers at our ports of entry, but also those stationed abroad. Furthermore, it is freely stated by officers of the public-health departments of many countries of Europe that the sanitary measures enforced by steamship companies, under the supervision of officers of this service, in preventing the embarkation for ports in the United States of persons suffering from or potentially infected with quarantinable diseases, have been far-reaching in their effect, extending even into the place of origin of these immigrants.

Medical and hospital treatment, the earliest function of this service, and one which has been continued without interruption for 126 years, still occupies an important place in its operations. During the year, 1,232,754 patient-days hospital treatment were provided and 403,864 out-patient treatments furnished. The majority of patients are merchant seamen, and by far the largest number of days relief in hospital is given to this class of beneficiaries. There is, however, a constantly increasing demand for hospital and other medical service from certain other beneficiaries, and especially by the Employees' Compensation Commission, whose patients now number 22.7 per cent of the total. The medical relief which will be required by the United States Coast Guard, for which the Public Health Service is the sole medical agent, will, it is estimated, be more than doubled during the coming year, owing to the growth of that organization. Of 3,282 beneficiaries remaining in hospital on June 30, 1924, approximately 6½ per cent were patients of the United States Veterans' Bureau.

The additional buildings for the National Leper Home at Carville, La., provided for in act of February 20, 1923, have been almost completed. This will add 240 beds to the capacity of the institution, which will shortly amount to 420. It is anticipated that these beds will be quickly filled with patients now in custody of State health officers who have been apprised of the new facilities.

The costs of hospital operation have been still further reduced over the preceding year, the average expense per patient per day in the marine hospitals amounting to \$3.89. In this field of operation the Government is justified in claiming success, since the character of hospital treatment compares favorably with that furnished by civilian hospitals in the same communities and at considerably less expense. The present costs of operation are now lower than continued efficiency warrants. It is not believed desirable nor in the final sense economical to attempt to further reduce hospital operating costs, which at the present rate of wages and commodities should probably average not less than \$4 per day. I venture to express the hope that appropriations will always be made sufficient to avoid the necessity of lowering the standards of medical and hospital care which the Government undertakes to provide.

Through the State Department from diplomatic and consular officers, from officers of this service stationed abroad, and from other sources, chiefly cooperative, as, for example, the reports of the health section of the League of Nations, the Public Health Service constantly receives reports of communicable diseases from all parts of the world.

During the fiscal year 109,359 cases of cholera, with 71,858 deaths, distributed over nine countries, were reported, the largest number of these cases occurring in India. There were a few cases in Russia and a total of 18 cases and 14 deaths in the Philippine Islands.

Bubonic plague shows a much wider distribution than cholera, there having been reported a total of 233,708 human cases, with 189,096 deaths, distributed among the peoples of 40 countries.

It is believed that even after allowing for duplication of reports that these figures are entirely too low for both cholera and plague. India and Java reported the largest number of cases and deaths from plague. Various European and South American countries continue infected, and no continent is free from this scourge. A large number of the seaports most commonly concerned in international trade are

actually or potentially infected with this disease, and no doubt many of them will remain so indefinitely and others will become infected from time to time. The system of fumigation for the destruction of rodents which this service has maintained with very little inconvenience to commerce is believed to have been instrumental in the prevention of the reintroduction of this disease into the United States during the year. However, it is probably only a question of time when plague will appear in this country in cities which have never been infected, and I feel that our people would be much safer, and would be saved great expense in years to come, if they could be induced to build more effectively against the rat. There is relatively little expense in making a dwelling, or any other structure, rat proof when it is being built, but the rat proofing of buildings that are improperly constructed involves very great expense, though it is the one effective measure in the combating of plague.

Smallpox remains the most widely distributed plague in the world, due to neglect of vaccination and revaccination and in part to organized opposition to this most efficacious measure. There is practically no country that is free from this disease. Reports of 149,550 cases with 22,346 deaths were received during the year. The fact that more than one-fifth of the cases reported occurred in the United States should not be taken to mean that this disease is more prevalent here than anywhere else, but that it is much better reported in the United States than in most other countries.

Typhus fever, though not as extensive or dangerous as plague, is still being reported from many countries. The measures enforced by the Public Health Service to prevent the introduction and spread of this disease are directed exclusively against the body parasite that conveys it and have proved entirely satisfactory.

Yellow fever was reported from only three countries during the fiscal year, and while still a very potential danger to the people of our Southern States, caused very little interference with our commercial relations during the season of 1923, and practically none so far during the present season of what was formerly the "closed quarantine" period of the year.

Cooperative measures with State, city, and local governments and with semiofficial and private agencies have continued throughout the year and form a very important part of the activities of this service. Among these operations may be mentioned the following: Plague-suppression work in California, consisting chiefly in maintaining squirrel-free zones around cities situated within or near squirrel-infected territory, assistance rendered in supervising rat-proofing work in San Francisco and Seattle, and surveys made in certain New England cities for the purpose of determining whether or not plague infection exists among rats and also for the purpose of determining the species of fleas found on these animals with a view to forecasting the significance of these parasitic infections in case plague should ever be introduced into these cities.

This service has for a number of years conducted intensive cooperative campaigns for the discovery and cure of cases of trachoma, a serious contagious disease of the eyes, which, untreated, invariably results in extensive impairment of vision and often total loss of sight.

Active and efficient treatment of trachoma, while difficult and requiring time, is essential to the cure of this disease, the conservation of the sight of infected individuals, and the prevention of its spread. The results of this work have been extremely satisfactory and it is hoped that sufficient interest may be created to push the work of exterminating trachoma in the United States to its conclusion. It will be recalled that a survey of the different Indian reservations in the United States made by this service in 1912 revealed an enormous number of cases of this disease among nearly every tribe of Indians existing in the United States. Inasmuch as in many places in certain parts of the United States Indian pupils attend the public schools, there is always danger of this disease spreading to other pupils. During April, 1924, in company with the Secretary of the Interior and the Commissioner of Indian Affairs, the officer in charge of trachoma-prevention work visited Indian schools in Arizona and New Mexico for the purpose of making a survey of the trachoma now existing among the Indian population of those States. This visit was undertaken at the request of the Secretary of the Interior for the purpose of formulating a program for the eradication of trachoma among the Indians. Such a program has been prepared and approved by the Commissioner of Indian Affairs and will, I understand, soon be made effective.

Supervision of water supplies used for drinking and culinary purposes by common carriers engaged in interstate traffic has been carried on in cooperation with practically all State health departments, and, while great improvement has been made in furnishing pure water to trains and vessels engaged in interstate traffic, the appropriations for this work have never been sufficient to render it complete. As a part of this work I am pleased to report that satisfactory progress is being made in inducing railroad officials to install systems which will obviate the necessity for ice being placed within the water containers, as this is known to be a very common source of contamination of water on trains.

It is gratifying to note the ever-increasing interest which is being manifested in public-health work. In this connection it may be stated that this service has recently cooperated with four universities in conducting schools of public health and with eight other universities and medical colleges in delivering lectures on the opportunities for a life career in the field of public health. There are 12 institutions of learning that now give courses in public health that lead to certificates or degrees or both.

Aid was given to the National Park Service at the request of the Secretary of the Interior in providing necessary medical attention and in improving sanitary conditions in the national parks. This work included assistance rendered in connection with the disposal of sewage and garbage, in determining and maintaining the purity of water and milk supplies, in malaria-control work, and the preparation and issuing of a bulletin on camp sanitation.

Demonstration projects in rural sanitation were conducted in 72 counties in 16 States. This is one of the most important and productive works in which this service is engaged. Along with \$43,584.52 expended by the Federal Government, approximately \$540,000 was provided to match these funds, mainly by State and county governments. It will thus be seen that the Federal funds expended in rural

sanitation were met with odds of more than 12 to 1. Excellent results have been obtained in communities where the allotment made from Federal funds ranged as low as \$300 to \$500.

Inasmuch as yellow fever is still a potential danger to the population of our Southern States, work in connection with the control of the breeding of yellow-fever bearing mosquitoes was carried on in many communities along our southern border. This additional safeguard helped to make it possible to suspend quarantine restrictions on account of this disease.

I may mention briefly the research work which is being prosecuted by this service and which is in part cooperative. These activities include:

Studies of deaths from cancer in the 10 States which formed the registration area for deaths in 1900.

Investigations to determine whether or not clonorchiasis, a serious oriental parasitic disease which has been introduced on our Pacific coast, may be propagated in this country naturally.

Investigations of food poisoning, a matter of very great importance in connection with our canning industries.

Studies of goiter, a very extensive and important public-health problem, particularly in certain Western and Middle Western States. This disease is found to be very extensive, but present indications are that a very great deal may be done to prevent it.

Studies are being made of influenza, the common cold, and other respiratory affections in large groups of individuals living in various parts of the United States. The importance of this class of diseases as a cause of disability can hardly be underestimated.

*Malaria.*—For 10 years this service has been engaged in the study of malaria, the object being to control this serious disease. As a result of these studies we can now look forward to the time when any well-equipped full-time county health organization will be able to handle its malarial problem effectively. Much has been done to determine the best methods of combating this disease and to reduce the cost of such work.

Continued studies on pellagra all tend to confirm former observations to the effect that this is a disease due to an improperly balanced diet and that consequently an adequate remedy against it can be provided.

A vaccine prepared from ticks infected with Rocky Mountain spotted fever has been found to protect animals which, without its use, almost invariably succumb from inoculation with this disease. As yet opportunity has not been afforded to test its efficacy in man.

Studies were continued on tularæmia, a widespread disease in rabbits in the United States, which is not infrequently contracted by human beings. Infection in certain species and ticks continued to be found as reported last year.

Studies are being pursued in the investigation of a disease resembling typhus fever which is endemic in certain places in the United States, but as yet it has been impossible to state definitely whether this is a new disease or an erratic form of typhus fever.

The importance of hygiene and sanitation in the many industries in which our people are engaged is a matter of definitely recognized concern to all health authorities. The activities of the Public Health Service with regard to these subjects included studies of occupational

health hazards, studies of occupational diseases, studies of the causes of industrial absenteeism, studies of conditions of lighting and ventilation, studies of posture in industry and its relation to health, studies of lighting in railway-mail cars leading to improvements in conditions, studies of mine sanitation, including sanitary surveys of mines and camps in connection with dust and ventilation and cooperative measures designed to improve existing conditions in industry. Cooperative consulting services have been maintained for several years past; numerous requests for information and advice have been received from industrial establishments, from associations of industrial workers, from State and municipal boards of health, public-welfare associations, privately operated health bureaus, and from Government departments concerning exposure to industrial hazards, occupational diseases, and many other questions relating to industrial hygiene and sanitation. This cooperative work has increased largely during the present year.

There has been completed in tentative form in cooperation with the American Engineering Standards Committee an industrial sanitary code. In cooperation with the office of child hygiene much work has been done in revising the code for the lighting of school buildings prepared by the sectional committee of the American Engineering Standards Committee.

For a number of years the Public Health Service has been engaged in making health surveys and studies of administrative practices of State and municipal departments of health. In 1920 and 1921 surveys of health services provided in 83 of the largest of the registration cities of the United States were undertaken by the committee on municipal health department practice of the American Public Health Association in cooperation with this service. The result of this work was published by the Public Health Service as Public Health Bulletin No. 136, one of the most important of our publications for the current year.

The importance of milk as a food and the dangers which may be caused by contaminated milk are matters too well known to need emphasis. It requires the utmost vigilance to provide a pure milk supply and the Public Health Service has continued to be actively interested in this great problem. The work in cooperation with the State Board of Health of Alabama in executing their state-wide milk sanitation program was continued. Assistance was rendered in other States in a consulting capacity relative to this same state-wide milk sanitation and a number of individual cities were assisted in organizing their milk sanitation work. Intensive studies have been carried out to provide a practical working plan for the rating of milk and to determine the proper specifications for the design of efficient-pasteurization machinery.

Studies in child hygiene and oral hygiene were continued as in previous years. These studies embrace investigations into the effect of intensive health supervision of a group of children during a protracted period, a study of the control of communicable diseases in schools, a study of absenteeism from school and the causative factors, a study of physical development as expressed in terms of weight and height, and studies in nutrition and in the natural illumination of classrooms. In terms of averages it was found that each child is ill during the school session an average of 2.3 times, involving a total



average loss of 7.3 days per child per school year, or 4.1 per cent of the possible days of attendance. The common cold and headache were found to be the most common causes of absence from school, with digestive disorders next in frequency. Grippe, influenza, tonsillitis, sore throat, and measles, however, caused considerably more absence in terms of days than either headache or digestive disorders. The duration of illness, as measured in school days lost per case, was found to be greatest in whooping cough, scarlet fever, pneumonia, diphtheria, and measles, in the order named.

The importance of mental hygiene as a factor in human life is well recognized and this subject has been given special attention during the present year. Previous studies have indicated that certain types of the foreign born living in America have contributed a very high proportion of mental diseases admitted to public institutions and conditions contributing to these admissions are being investigated. The effect of venereal diseases in producing mental instability and insanity exerted either directly or through hereditary influences is too well established to require comment except to emphasize the need for continued work in the combating of these diseases.

For a number of years the service has been engaged in investigations of pollution of streams and of associated studies on problems relating to the purification of water supplies and the disposal of sewage, which studies are being pushed to completion. These problems are of such broad and general character that they require some years of consecutive effort to accomplish any important result. An attempt is also being made to determine more precisely the physical and biologic conditions which govern the rates of natural purification in streams. Inasmuch as the discharge of certain waste products of industry into numerous streams has given rise to a very serious problem in connection with the purification of these waters for drinking purposes, effort is being made to determine just how much pollution a stream will tolerate before the condition of the water is such as to render it impracticable or too expensive to purify it effectively for drinking and other domestic purposes.

Research work in tuberculosis has been continued and a number of alleged cures for tuberculosis have been tested on experimental animals, but in each case the results were disappointing.

In connection with the work on Malta fever and tularemia, which has appeared in the United States, I regret to have to record the fact that two physicians and several laboratory workers have been attacked by one or the other of these diseases through experimental work and have suffered long and seriously from their effects.

A study of the narcotic drug addiction situation in the United States suggests that while this is a very serious problem, the extent of this addiction has been exaggerated by some who are interested in this subject. Carefully made surveys and studies indicate that during the period of greatest prevalence there were probably no more than 264,000 addicts in this country and it is estimated that there are not over 150,000 at the present time.

The results of studies of the relative efficiency of certain anti-syphilitic drugs indicate that sulpharsphenamine is probably the most efficient of these in the treatment of syphilis. It has been determined that this drug can be given with excellent results by the mouth. These studies also indicate that sulpharsphenamine is a

very valuable remedy in the treatment of neurosyphilis and of Vincent's angina.

Work was continued on insulin with particular reference to the standardization of this important drug, a new method being devised for this purpose which has revealed the fact that there is considerable variation in the potency of commercial supplies of this important substance.

## DIVISION OF SCIENTIFIC RESEARCH

In charge of Asst. Surg. Gen. A. M. STIMSON

The purposes and general methods of this division have been sufficiently described in previous reports. The subjects under investigation during the past year have included at least some phase of all or nearly all of the major public-health problems which confront the Nation and in which further research has been required for their practical solution. Many of these activities are not new and represent the attempt to refine our knowledge of the conditions studied in the interest of effecting economies in practice. Although the essential cause of a disease or other adverse health condition may have been discovered long since, and the logical means of eradication outlined, it is often the case that in spite of this essential knowledge little progress is being made in the reduction of the evil, not because of neglect, but because the knowledge supplied has not been in such detail as to furnish a practical economic program. Even where definite progress has occurred, it is often at heavy expense, owing to the use of cumbrous methods, whereas with better knowledge a clean-cut and better directed method would have been more effective and far less expensive. It must be regretfully confessed that throughout the country in general it is customary for legislative bodies to allot but scanty funds for the development and maintenance of public-health agencies, in consideration of the importance of their activities to public welfare. Hence it becomes essential that these activities be planned so as to afford maximum returns. This can not be accomplished by mere thought. The experimental method must be resorted to, and the results from such method are daily proving it to be well worth the money and effort expended upon it.

Such new investigations as have been undertaken have been the result either of a foresight which strove to check a potential or impending danger before it became a permanently settled evil or of the recognition of an existing danger on which research might be expected to throw light. Disease—under which broad term we must include a great variety of conditions which interfere with that sane, normal, and enjoyable progress of human life which we call health—is not of single or of simple origin. It is due to many conditions of habit, custom, and social and economic status quite as much as to mere physical environment and the presence of pathogenic micro-organisms. The researches of the service have been planned to take cognizance of this truth and to devote attention to these more recently recognized factors as opportunity was afforded. There is no pretense that this has been done adequately. The question of funds and personnel has always limited the response to what seemed obvious needs, but a sincere attempt has been made to balance the program so that no really pressing need for research on the part of a governmental agency should be completely neglected.

As in the past, the activities will be described under the headings of major continuing activities, and individual diseases or minor

topics. It would be both invidious and unscientific to select any particular achievement for special mention, since no one can tell what enormous importance may attach to an apparently insignificant contribution, provided that it be well established and once and for all time placed among the "things known."

A brief summary of the activities of the division during the past fiscal year follows:

### CANCER

The cancer studies were continued under the direction of Surg. J. W. Schereschewsky. Studies were completed of the course of cancer mortality in the 10 States which formed the registration area for deaths in 1900—Connecticut, Indiana, Maine, Massachusetts, Michigan, New Hampshire, New Jersey, New York, Rhode Island, and Vermont. By selecting these States it has been possible to study and analyze what has taken place in cancer mortality in a fairly homogeneous area, both from the population and geographical standpoints, for a period of 21 years, thus embracing as long a period and as wide an area as is practicable so far as vital statistics in the United States are concerned. This area had a population of 19,643,176 in 1900 and 27,511,849 in 1920. In this area the course of cancer mortality was analyzed in the following ways: The death rate from all forms of cancer for all ages and then by nine specific age groups; the mortality by each specific age group according to the site of the disease as given in the international classification. Analysis of the results and comparisons with the course of other diseases causing high mortality were made to bring to light, if practicable, any progressive factors which were at work on the diseases which affect particularly the older age groups.

The death rate for all forms of cancer has shown a steady and practically continuous rise in these States since 1900. No changes of great moment are apparent in the death rates in the younger age groups. Commencing, however, with the age groups 30-39, a tendency toward increase becomes more marked with each successive decade.

As a result of these studies it must be concluded that there has been a definite increase since 1900 in the mortality from cancer for the past 21 years in the 10 original registration States and, moreover, that this is a real and not an apparent increase which might be accounted for by better diagnosis, shifting of diagnosis, and change in the age constitution of the population.

In addition to the statistical work, a beginning was made on the work of the cultivation of tissues *in vitro*, as it was realized that studies of cell growth form one of the logical points of contact in the investigation of cancer etiology.

### CLONORCHIASIS

During the past year the investigations to determine whether clonorchiasis may be spread on the Pacific coast have been carried out along the lines indicated in the previous annual report, Surg. N. E. Wayson continuing in charge.

Effort has been concentrated on laboratory studies with the aim of infecting the snails and fishes of the Pacific coastal waters, which

were suspected of being susceptible. The changes of environment in aquaria have been studied primarily as to their effect on the spontaneous hatching of the ova of parasites. It has been determined that the ova will hatch under laboratory conditions in water which has been boiled and maintained at a temperature between 75° and 80° F. The results have not been constant.

Feeding experiments have been conducted with guinea pigs and rabbits to determine whether these animals were inoculable by direct methods. Feces containing eggs were fed, but with uniformly negative results.

Some of the coastal cities dispose of their sewage by running it through septic tanks for a period of a few hours and distributing the effluent on waste lands. During periods of heavy outflow the effluent water finds its way directly to irrigation ditches after but little settling. Efforts were made with a small model of an activated sludge tank and with cylinders, under septic conditions, to determine whether modern methods of sewage disposal would destroy clonorchis ova. The ova were uninjured in so far as could be determined microscopically, and eggs of the hookworm used as a control hatched after several days' exposure to either septic conditions or those in the experimental sludge tank.

Investigations were made, including statistical studies and laboratory experiments, to aid in effecting standard procedures of examination at Pacific coast ports for the detection of clonorchis and other intestinal parasites in arriving aliens. It was found that precautions must be taken in the cleaning of utensils which are used for repeated examination, as the ova of clonorchis, ascariis, and the whipworm are difficult to destroy by heat or chemical means.

### FOOD POISONING

The investigations of food poisoning were greatly curtailed during the year.

On request of the State health authorities, the service assigned Passed Asst. Surg. C. A. Armstrong, in the summer of 1923, to investigate outbreaks of supposed poisoning at Danville and Waterview, Va. At Danville it was found that the outbreak was botulism; and canned sausage was considered to be the causative agent. At Waterview it was found that on account of the symptoms the disorder could not be botulism. The source of the trouble was supposed to be milk, and recommendations were made for the prevention of a recurrence.

Reports on outbreaks of botulism at Albany, Oreg., and Sterling, Colo., February, 1924, investigated and described by the State health officer of Oregon and Epidemiologist J. C. Geiger, were published in the Public Health Reports, April 4, 1924.

### GOITER

While the Public Health Service has been interested in the prevalence and prevention of goiter for a number of years, several of its officers having completed extensive surveys, it was not until July, 1923, that systematic goiter studies were begun. Office space was made available in the stream pollution investigations station at

Cincinnati, Ohio, and Surg. Robert Olesen was placed in charge of this work.

As a preliminary activity a careful study was made of the literature dealing with goiter, especial attention being directed to the so-called simple or endemic form. In addition to compiling goiter references, many abstracts of articles were prepared. These references have proved of great value in answering questions concerning various phases of the goiter problem which have been received from numerous sources.

A careful field study extending over six months was made in order to accomplish a thyroid survey of 47,493 elementary-school children in Cincinnati. This is one of the most extensive goiter surveys that has been made in a single community, and it has provided much valuable information on a number of vital points. Evidence of thyroid enlargement was found in 15,751 of the 47,493 children examined, a percentage of 33.2. However, approximately one-half of the enlargements noted were classed as very slight. Thyroid enlargement prevailed among boys to the extent of 26.6 per cent, whereas among girls it reached the much higher percentage of 39.8. It was found that there was no racial immunity to endemic goiter among colored children. As a result of the survey, recommendations were made to the Board of Health of Cincinnati that the use of iodized table salt be favored in the city, especially by those with apparently normal thyroids. It was urged that children with enlarged thyroids receive appropriate treatment from their family physicians. A report of the survey was published in the Public Health Reports.

Several weeks were spent by the service representative in the Mayo clinic for the purpose of becoming familiar with the methods of diagnosis and treatment in that medical center. Special attention was devoted to the methods of determining basal metabolic rates and the histologic appearances of various types of goiter.

While it is fairly well settled that endemic goiter is due to a deficiency of iodine, the fundamental cause of the malady, or what primary condition is fundamentally responsible for the disturbance of thyroid equilibrium, is quite unknown. There is, therefore, an ample field for continued research.

It has been possible thus far to allot to this subject only a very modest portion of the field investigation funds. The problem of goiter is, however, an important one in many sections of the country, and it is believed that the studies already accomplished fully justify the expenditure and the continuation of the work.

### INFLUENZA

Early in the summer of 1923 the Public Health Service undertook a study of the epidemiological aspects of influenza and the "common cold," and other minor respiratory disorders, in an effort to find out more regarding the occurrence and behavior of these disorders, especially the interepidemic phases of influenza. The investigations were directed by Surg. J. G. Townsend.

Arrangements were made to obtain many periodical reports as to the occurrence or nonoccurrence of acute minor nose, throat, and chest disorders in large groups of individuals over widely scattered

areas of the United States, these reports to cover a period of time long enough to make a morbidity and an epidemiological study of value. The college groups were chosen because they provided comparatively easy access to organized groups of individuals situated in the same place and living under the same general conditions and because it was believed that reports of real value would be obtained from such groups.

To offset the selective age grouping naturally found in colleges, and to study more intimately the behavior of minor respiratory affections in family life, groups of families all over the United States were also asked to render morbidity reports covering the occurrence or non-occurrence of nose, throat, and chest troubles for each member of the family, including household servants. These groups represented the families of medical officers of the Army, medical officers of the Navy, the medical and scientific personnel of the Public Health Service, and the faculty members of the selected colleges.

The method of procedure was to distribute among the students of the various colleges an enrollment record in which certain information was requested as to past influenza or pneumonia history, whether or not the reporter was subject to chronic nose and throat diseases, habits as to amount of fresh air during sleep, kind of underwear worn during the winter, amount of outdoor and indoor exercise generally taken, and the average number of colds experienced during the year.

After receipt of this information, blanks were mailed to each student twice each month covering the periods from the first to the fifteenth and the sixteenth to the end of the month, respectively. He was requested to report on this blank whether or not any respiratory disorder was experienced during the period in question. If the report was positive, further information was requested as to duration, severity, symptoms, history of contact (if any), and other attendant circumstances.

The same method of procedure was carried out with the family groups, but a different clinical report form was submitted semi-monthly, on which the report was given for the entire family.

The following universities were selected for these investigations:

University	Location
Harvard.....	Boston, Mass.
Mount Holyoke.....	South Hadley, Mass.
Johns Hopkins.....	Baltimore, Md.
Georgetown.....	Washington, D. C.
Howard (colored).....	Do.
Tulane.....	New Orleans, La.
Ohio State.....	Columbus, Ohio.
Chicago.....	Chicago, Ill.
Utah.....	Salt Lake City, Utah.
Montana.....	Missoula, Mont.
Arizona.....	Tucson, Ariz.
California.....	Berkeley, Calif.

At some of the above-mentioned places contact representatives were placed on duty as part-time workers to stimulate the work, keep up the interest of the student body through the school papers, and, in general, to act as a liaison between this office and the students. These contact representatives were carefully selected students.

The reports were distributed, filled out, and collected in the classrooms at some of the schools, then mailed to the bureau in bulk; at

the other colleges each student was communicated with direct. The latter method has proved more satisfactory.

Out of a total of 13,062 volunteers who agreed to submit reports, only 1,666, or 12.8 per cent, have asked to be dropped from the files or have never submitted subsequent reports, while a total of 11,396, or 87.2 per cent of the total number enrolled, are submitting regular reports, with 41.4 per cent not sending them in on time but eventually submitting them.

Of the 1,770 families enrolled, only 210, or 11.9 per cent, have dropped out, leaving a total of 1,560, or 88.1 per cent, who are sending regular reports and only 4.7 per cent who are not submitting them on time. These combined figures emphasize the interest that is being shown by those who are assisting the service in this important piece of health research.

Charts are being kept for each locality, showing the morbidity rate per 1,000 of each class of nose and throat disorder reported, together with the precipitation, humidity, and temperature of each place reporting, the United States Weather Bureau cooperating by submitting meteorological reports. A chart is also kept revealing the morbidity rate per 1,000 of influenza in one group and of other respiratory diseases in another group for all localities studied. On this chart are indicated the rise and fall of the rates for the period studied.

Since the collection of reports from all localities has been in progress barely six months, no report has been compiled as yet for comparative study.

### MALARIA

The Public Health Service has conducted studies of malaria in the United States for more than 10 years. The object of these studies from the beginning has been the control of malaria in the United States. Gratifying progress has been made, some malaria problems have been solved, and a far better understanding of the entire malaria situation has been achieved. As a result of these studies we can now confidently look forward to the time when any well-equipped full-time county health organization in the United States will be able to handle its malaria problem as effectively as any other rural health problem. The progress of these malaria studies has been somewhat slow for two reasons: First, in order that they might have a practical public health value, it was necessary first to educate the people in malaria transmission, stimulate interest in malaria control, and demonstrate the feasibility of controlling malaria in the United States at a reasonable cost. It was not until 1923, nine years after these studies were begun, that it was felt such progress had been made in these preliminary educational measures as to justify the Public Health Service in discontinuing malaria educational campaigns and demonstrations of malaria-control methods. The second reason is that the allotment available for this study from year to year has not been adequate to cover the entire malaria field. Therefore it has been necessary to select the most important and most pressing problems for study at any one time, taking them up one by one as the malaria allotment would permit.

Malaria field investigations were continued during the fiscal year under the direction of Surg. L. D. Fricks. with headquarters at



Memphis, Tenn. The most important subjects under investigation during the year were as follows: (1) Epidemiology of malaria; (2) rural malaria control; (3) control of man-made malaria; (4) fish control of malaria; (5) life habits of malaria mosquitoes; (6) mosquito control.

I. *Epidemiological studies.*—In beginning the study of malaria in the United States it was recognized that very little accurate information was to be had concerning its prevalence in this country, knowledge of where, when, and why primary infections were taking place, such as is considered fundamental for the control of all infectious diseases. For many reasons malaria presents a peculiarly difficult problem in this respect. Primary infections may be delayed, relapses are common, diagnosis is not always easy, the patient is frequently not seen by a physician, and, in regions where malaria has been widely prevalent, the tendency is to call most febrile conditions malaria offhand, regardless of their etiology. The Public Health Service has continuously sought to encourage the more accurate diagnosis and the more complete reporting of malaria in the United States. Progress has been made in both of these directions during the past 10 years, which has been much more rapid since the assignment of an officer trained in the epidemiology of diseases, to this particular study. Asst. Surg. K. F. Maxey has spent two years studying the distribution of malaria in the Southern States, collecting and analyzing malaria morbidity and mortality reports received by the different State health officers, and encouraging and assisting the laboratory and vital statistics divisions of the various State health departments in collecting more accurate information concerning the prevalence of this disease. Reports have been published from time to time of the progress made in these studies, and unquestionably our knowledge of malaria distribution in the United States as a result of these studies is now much more comprehensive and exact than heretofore. When subjected to rigid blood examinations of suspected persons, many localities in the United States have been found where malaria is much less prevalent than it was commonly supposed to be. Gradually this "traditional" malaria is being eliminated under improved methods of diagnosis and increased activity in reporting.

During the year studies were made of epidemic outbreaks of malaria and the conditions under which malaria foci are being established around temporary sawmills and construction camps which promise to throw considerable light upon the spread of the disease in the United States.

The study of malaria prevalence through malaria surveys of school children, particularly in the rural districts, was continued during the winter months. These studies were begun in Mitchell County, Ga., in January, 1921, the primary objects being to determine a simple measure of malaria prevalence and to establish the correlation among positive malaria histories, positive blood specimens, and enlarged spleens under conditions obtaining in the United States. The school group was selected because it is easy to reach, it is usually representative of the malaria situation in the locality, and because of its educational possibilities. At the time these studies were begun very little importance was attached to splenic enlargement as an index of malaria prevalence in the United States. These

studies have shown that where malaria is sufficiently prevalent to be of serious sanitary importance splenic enlargement is a fairly accurate index, which can be readily employed by any county health officer, of the amount of malaria in the community and that there is a close correlation among positive malaria histories, positive blood specimens, and enlarged spleens. Since beginning these malaria surveys of school children, 13,159 children have been examined for enlarged spleens, and 11,691 blood smears collected at the same time have been examined. The schools surveyed have been selected from widely separated localities in all of the Southern States. Usually the selected schools were located in counties having full-time health units in order to support the county health officer in his work and in order that he might benefit by this easy method of determining malaria prevalence. During the winter months of 1923-24 Acting Asst. Surg. C. P. Coogle surveyed 100 rural schools in six Southern States. Examinations of 4,325 children were made for enlarged spleens and 3,914 blood smears from these children were collected and sent to the Memphis laboratory for examination.

II. *Rural malaria control studies.*—Since malaria in the United States is a disease of rural communities, the study of rural malaria control is considered to be one of the most important branches of the malaria investigations conducted by the service. These studies were continued during the year by five sanitary engineers and two medical officers of the service in 32 selected counties of eight States. These studies of rural malaria control are a natural development from and extension of demonstrations of urban malaria control which have been conducted by the Public Health Service. The general program of rural malaria control investigation was first outlined and adopted by the Public Health Service in 1921; but it was not until 1923 that release from other activities enabled the service to put this program into effect on its present extensive scale. Only minor alterations have been made in the study program as first adopted, and the plan of selecting counties with full-time health organizations for study and of conducting the studies in close cooperation with the county health officer has been amply justified. The general program of these studies has been for the service representative and the county health officer, working in close cooperation, to locate malaria foci in the county; to locate mosquito-breeding areas; to study mosquito production and control in these areas; to study drainage of the county, make drainage maps, and determine the best drainage programs for the county; to encourage and assist drainage; to encourage and study effects of screening; to study mosquito repellents and larvicides; to study fish control and encourage the stocking of ponds and streams with *Gambusia*; to study other methods employed in rural malaria control, such as quinine sterilization, education, publicity, etc.; to check carefully and analyze results secured in malaria reduction; to determine and evaluate causes of reduction. Obviously this program will require several years for completion. The eradication of malaria from a community, however effective the method employed, does not always follow immediately, nor is it easy to measure accurately the rate of reduction which is being accomplished. Immediate and obvious results have followed from these studies, however, such as increased interest in rural malaria control by local health officials and by the

public, increased appropriations for rural malaria control and rural health work generally, and increased organization of full-time county health units in those parts of the United States where malaria is a public health problem. These results are gratifying and will in themselves greatly aid in solving the malaria problem of the United States.

III. *Study of "man-made" malaria.* In the potentially malarious regions of the United States malaria has frequently been increased by man's interference with natural drainage, both when large bodies of water are intentionally impounded for power purposes and when smaller bodies of water are negligently impounded in connection with construction projects, such as highways and railroads. Both of these subjects have been carefully studied by the Public Health Service, and it is felt that the general principles involved in the control of malaria around such projects have been determined and that where the State health authorities are resolved to enforce proper regulations for governing these projects, there need be no fear of improvements of this character increasing the malaria problem of a community. During the year one sanitary engineer and one medical officer were engaged in the study of impounded water in relation to malaria in North Carolina, South Carolina, and Alabama. A regulation for the control of malaria around impounded water projects was prepared by the Public Health Service, and has been adopted by the States in which malaria is a serious health problem and the impounding of water is of great importance. The following items are considered fundamental in controlling the spread of malaria around impounded water projects during the first few years of their existence: (1) Proper housing and medical care of imported labor; (2) mosquito control in vicinity of construction camps; (3) proper clearing of pond site; (4) control of flottage in pond; (5) periodic changes in water level; (6) stocking impounded waters with *Gambusia*.

No malaria surveys of interstate railway lines were made during the fiscal year, but the six southern railway systems which have been surveyed were kept under observation, their antimalaria programs were studied, and suggestions were offered where needed to perfect them with a view to preparing an analysis of malaria control methods enforced and results obtained thereby.

Closely related to the problem of "man-made" malaria from impounded waters and highway construction is that of major drainage operations in relation to malaria. The natural tendency in these reclaimed areas in southern United States is a reduction in malaria prevalence, but the reduction rate varies greatly and has not always been as rapid as one would expect in view of the enormous mosquito-producing areas eliminated by the drainage operations. For these reasons a study of major drainage in relation to malaria has been undertaken and an associate sanitary engineer assigned to this study in the delta region of the Mississippi Valley. Drainage districts in eastern Arkansas and northwestern Mississippi were selected, drainage statistics and malaria morbidity reports collected and compared with adjoining undrained areas, and field studies of *Anopheles* production in drainage ditches were made. It is expected that after further study of this subject we may be in a position to make recommendations concerning the maintenance of drainage ditches and the taking

of other reasonable precautions in these drainage districts which will result in a greater reduction of malaria than major drainage has heretofore been able to accomplish.

IV. *Fish in relation to malaria control.*—Mr. Samuel F. Hildebrand, of the Bureau of Fisheries, continued his cooperative study of the use of small fishes in controlling mosquito production. These studies were conducted at Augusta, Ga., and around certain impounded water projects which were under investigation by the Public Health Service in Alabama and North Carolina. Mr. Hildebrand's studies during the year covered the following phases of fish control: (a) Effects of plant removal in increasing *Gambusia* efficiency; (b) effects of overstocking with *Gambusia* on mosquito production; (c) relationship of plant growth to effectiveness of *Gambusia*; (d) methods of handling *Gambusia* in confinement and during shipment; (e) behavior of *Gambusia* during the period of parturition.

It was found that in handling and shipping *Gambusia* the fish do equally well in about one-third the quantity of water in the container which has heretofore been considered necessary. Water three or four inches deep is adequate. Advice has been furnished as to the proper methods of maintaining *Gambusia* hatcheries around impounded water projects in North Carolina and Alabama.

V. *Special field studies.*—Three malaria laboratories were operated during the year in conducting special studies of malaria. A malaria laboratory at Memphis, Tenn., was maintained for the routine examination of blood smears collected in the field and for the diagnosis of suspected malaria reported by physicians from Memphis and surrounding territory. The object in view in making blood examinations of cases reported as suspected of having malaria in and around Memphis is to check the diagnosis of malaria in a community which was known to be highly malarious a few years ago and to determine the actual decrease which has taken place. During the year, 7,401 blood smears were examined for malaria plasmodia at the Memphis laboratory, of which number 3,763 were collected as a part of malaria school surveys made in six Southern States, 3,096 were sent in locally for diagnosis, and 542 were sent in from different State health departments for diagnosis. In addition to these routine blood examinations, a special study was made of the blood picture of malaria in cases undergoing quinine treatment with a view to determining the percentage of carriers remaining in malaria cases treated for 12 months or more. Monthly blood examinations of these cases have been made and will be continued as long as they can be kept under observation.

At the beginning of the fiscal year the field laboratory at Badin, N. C., was transferred to Savannah, Ga., where the following studies have been conducted by Mr. Mayne, in charge of this laboratory during the year:

- (a) Winter habits of *Anopheles* in Chatham County, Ga.
- (b) The effect of cold on the development of *Anopheles* mosquitoes.
- (c) Resistance of mosquito eggs and larvae to desiccation.
- (d) Relative importance of *A. crucians*, *A. punctipennis*, and *A. quadrimaculatus* in transmitting malaria.
- (e) Study of methods for shipping mosquito material.

Special reports have been made of these studies from time to time.

The field laboratory at Crowley, La., was continued under the direction of Dr. M. A. Barber. This laboratory was located at

Crowley primarily for the purpose of continuing the study of malaria prevalence in rice fields, a similar study having been conducted around Stuttgart, Ark., and another in the rice fields near Chico, Calif. Doctor Barber has found, along with prolific mosquito production both at Stuttgart and at Crowley, a relatively low percentage of malaria infection among the people living in these rice field regions. In addition to the rice field studies, many other special studies of malaria and malaria mosquitoes have been carried on at this laboratory, the most important of which are as follows:

- (a) Seasonal variation in malaria types.
- (b) Winter habits of *Anopheles*.
- (c) Hydrogen-ion concentration and other factors influencing *Anopheles* production.
- (d) Larvicides.
- (e) Culicifuges and culicides.
- (f) *Anopheles* flight range and dispersal habit.
- (g) Domestic animals in relation to malaria.
- (h) Mosquito infectivity.
- (i) Relative importance of *A. quadrimaculatus*, *A. crucians*, and *A. punctipennis* in malaria transmission.
- (j) Study of malaria in Central America (visited by Doctor Barber).
- (k) Study of localized outbreaks of malaria occurring in the northern part of the United States.
- (l) Study of methods for shipping mosquito material.

Special reports have been published from time to time dealing with these studies. Eleven publications reporting special malaria studies and observations were prepared for publication by the malaria personnel during the year.

VI. *Malaria control around government hospitals.*—At the request of the Director of the Veterans' Bureau the inspection of malaria-control operations around certain government hospitals in which disabled soldiers were being provided with hospital care by the Veterans' Bureau was continued during the year. These hospitals include Hospital No. 27, Alexandria, La.; Hospital No. 63, Lake City, Fla.; Hospital No. 74, Gulfport, Miss.; and Hospital No. 84, Algiers, La. Periodic inspections were made of mosquito-control operations around these hospitals, and recommendations in writing were submitted at the termination of each inspection to the medical officer in charge of the hospital and to the medical officer in charge of field investigations of malaria.

## PELLAGRA

The field investigations of pellagra were continued under the direction of Surg. Joseph Goldberger. Surg. G. A. Wheeler and Surg. W. L. Tanner have assisted Doctor Goldberger in these studies. Considerable progress was made toward completing the analysis of the data collected in the studies of pellagra prevention at certain orphanages and at the Georgia State Sanitarium during 1915-1917, and in the study (1917 to 1921) of factors related to pellagra prevalence in certain cotton mill villages of South Carolina. Reports of some of the results of these studies appeared in the Public Health Reports.

Some tests at the Georgia State Sanitarium in the treatment and prevention of pellagra by means of gelatine, fresh lean meat, cod liver oil, butter, and fresh buttermilk carried out during 1922-23 have also been recently published in the Public Health Reports. Fresh meat and buttermilk were proved to have decidedly beneficial effects in the treatment and prevention of the disease; gelatine, cod liver oil, and locally produced butter were without appreciable effect.

The studies actively carried on during the year were along the same general lines or in continuation of those of 1923.

The studies during 1923 having demonstrated the preventive value of fresh buttermilk, it seemed desirable to continue the study of milk by a test of the preventive value of dry skim milk. Accordingly, such a test was begun early in the fiscal year and was making satisfactory progress at its close.

A test of the preventive value of purified casein begun early in January, 1923, was carried on throughout that calendar year and into 1924, with results indicating that this protein has a modifying but not a completely preventive effect on the development of the symptoms of pellagra; the distinctive dermatitis of the disease was prevented, but the stomatitis, with certain other symptoms (pellagra sine pellagra), developed in spite of this casein supplement. It would thus appear that in the prevention (and causation) of pellagra some as yet unrecognized dietary factor plays an essential rôle.

Indications afforded by certain experimental feedings at the Hygienic Laboratory in connection with "black tongue" in dogs led early in the fiscal year to the inauguration of therapeutic and preventive tests of dry brewers' yeast. These tests were still in progress at the close of the fiscal year, with indications that valuable results may be expected. The foregoing therapeutic and preventive clinical studies have been carried on at the Georgia State Sanitarium, with the valuable cooperation of the officers of that institution.

Feeding experiments in dogs begun during the fiscal year 1922, in cooperation with the Hygienic Laboratory, and continued steadily ever since, are beginning to yield results of great interest. It has developed that certain diets which in previous studies had been found to be associated with the occurrence of pellagra are, when fed to dogs, followed by the development in this species of the pellagra-like syndrome of Chittenden and Underhill. The service investigators have identified this syndrome as clinically identical with "black tongue" of dogs.

This experimental condition in the dog has been found to present certain clinical similarities to human pellagra and, with the possibility of its being the analogue of the human disease in mind, has been the subject of continuous study throughout the year. This study has yielded indications that dry brewers' yeast has a beneficial effect in the treatment and prevention of "black tongue." This, as already mentioned, has been applied in the treatment and prevention of pellagra with a distinct promise of favorable results in this disease. Final judgment must, however, wait on the conclusion of the tests.

The cooperative arrangement with Yale University entered into during the fiscal year 1923 for investigations in the field of diet and nutrition was continued during the fiscal year 1924. Profs. Frank P. Underhill and Lafayette B. Mendel, representing the university, have studied the cause, treatment, and prevention of the Chittenden-

Underhill pellagra-like syndrome in dogs and have come to the important conclusion that this pathological state of nutrition is associated with a lack in the diet of a factor present in butter.

Clinical tests in the treatment and prevention of the human disease at the Georgia State Sanitarium with locally produced butter have been without evidence of benefit; but by reason of the great importance of both the practical and theoretical questions involved, it is hoped that further more exhaustive tests may be practicable during the fiscal year 1925.

The suspicion having arisen that trachoma might be of dietary origin, an inquiry into this was made late in the fiscal year. A number of patients with well-marked trachoma observed at two trachoma clinics of the Missouri State Board of Health and at the service trachoma hospital at Rolla, Mo., were questioned as to their diets, but the information thus elicited failed to give any support to the suggestion that trachoma is of dietary origin.

### ROCKY MOUNTAIN SPOTTED FEVER

Investigations were continued at the field station at Hamilton, Mont., during the year and also at the Hygienic Laboratory in Washington, D. C., during the winter months. Surg. R. R. Spencer, assisted by Special Expert R. R. Parker, continued in charge of the investigations under the supervision of the Director of the Hygienic Laboratory. The progress made is embodied in the following statements:

1. Field studies and laboratory tests have shown the importance of rabbits and especially of the rabbit tick, *Hæmaphysalis leporis-palustris* Packard, as factors in the maintenance of Rocky Mountain spotted fever in nature.

2. In the Bitter Root Valley of Montana the percentage of infected ticks in mountain country is double that among ticks in the adjoining valleys. The wild mountain goat, although apparently immune to the disease, is responsible for the maturing of large numbers of adult ticks in the mountain areas.

3. A comparative study of the infection in animals and in ticks has revealed the fact that the infective agent or virus passes through developmental phases in the tick (intermediate host). No such phases have been observed in the animal host.

4. At one phase, corresponding to the hibernation of the tick, the virus is noninfective; at another, corresponding to the feeding time of adult ticks, it is highly virulent and infective.

5. A vaccine prepared from infected ticks during the stage of highest virulence has been found invariably to protect small animals. By concentration and refinement it is hoped to use this vaccine successfully on human beings. In the single instance in which it has been injected into man no harmful effects were noted.

6. Incidental to the spotted-fever investigations, tularæmia has been found among ticks from nature as mentioned in last year's report. Under laboratory conditions the infection has now been kept in a virulent state for 332 days in the wood tick (*D. andersoni*) and for 260 days in the rabbit tick (*H. leporis-palustris*). The eggs from an infected female of *D. andersoni* have been found infected by animal-inoculation tests. These observations emphasize the importance of ticks as winter reservoirs for this infection.

## TYPHUS FEVER

*Savannah, Ga.*—During the year, on request of the State and city health departments, the service detailed Asst. Surg. K. F. Maxey to investigate a number of reported cases of Brill's disease. In March, 1924, Doctor Maxey reported that on the Weil-Felix test, Brill's disease, or mild typhus, was shown to be endemic in Savannah, and that it was probable that a clinical syndrome resembling Brill's disease was rather generally scattered over the southern Atlantic States. It would be difficult, though not impossible, to account for the spread of the disease by means of lice.

## INDUSTRIAL HYGIENE AND SANITATION

During the fiscal year 1924 the activities of the office of industrial hygiene and sanitation were continued under the direction of Surg. L. R. Thompson. They included (1) studies of occupational health hazards; (2) studies of occupational diseases; (3) studies of the causes of industrial absenteeism; (4) studies of the use of cyanogen chloride as a new fumigation gas; (5) statistical studies; (6) co-operation with Government departments; (7) cooperation with industrial and other agencies.

## I. SURVEYS OF OCCUPATIONAL HEALTH HAZARDS

*A. Studies in ventilation.*—Two practical studies of ventilation were made during the year. The first of these was at the immigration station, Ellis Island, N. Y., being concerned with the study of ventilation and housing conditions at that place; and second, a study of the ventilation of the hall of the House of Representatives. Reports on both of these studies were made to the proper authorities.

During the year, Sanitary Engineer Leonard Greenburg continued studies relating to ventilation, under the immediate supervision of Consulting Hygienist C. E.-A. Winslow, of Yale University. Most of this work related to the designing and construction of electrical and hand-driven impinger dust-sampling apparatus. In last year's report it was pointed out that comparative laboratory tests of the new impinger apparatus had been made. During the present year considerable study was given to testing the value of the impinger in field work. In these tests the Palmer apparatus, the impinger, and the konimeter were used in simultaneously sampling atmospheric dust in atmospheres containing various amounts of dust. The results of these tests confirmed the laboratory tests that the impinger apparatus gave more satisfactory results under all conditions of dustiness than any of the other instruments.

*B. Dust in industry.*—The most important and extensive study carried on during the year has been that of the study of dust in industry. This study is under the supervision of Surg. J. F. Worley. Four units, each consisting of a physician, nurse, and clerk, continued to operate during the entire year. The kind of work of each unit is the same, and, as referred to in last year's report, consists of (1) physical examination of groups of workers in occupations exposed to the particular dust under study, including X-ray examinations of the chest of all cases in which any abnormality is suspected, and of



selected groups, depending upon the length of time in the occupation; (2) establishment of absentee records for the group under study, with special reference to the amount of time lost from work on account of sickness; (3) job analysis to determine the character of work, and the study of the quantity of dust each worker is exposed to, including an analysis of the dust to determine its chemical nature, and the size and number of particles contained; (4) pathological examinations from available material.

The units operating are:

(a) *Hagerstown, Md.—Cement dust.*—The work at this station is practically finished, and covers a period of two years for a group of 270 workers. The results will be submitted for publication as a separate monograph in the coming year.

(b) *Meriden, Conn.—Silver polishing.*—A group of 450 persons exposed to dusts of the various chemicals used in silver polishing and a group of approximately the same size who are not exposed to dusts of any kind are being studied at this station. A special study has been made of the sanitary conditions of the workrooms and a complete job analysis made of the work of persons engaged in each particular occupation. In addition, a complete study of the dust problem of the plant has been finished, consisting of 176 determinations of dust in the atmosphere in the various rooms.

(c) *Wilkes-Barre, Pa.—Hard-coal dust.*—The group here consists of approximately 725 underground mine workers.

(d) *Barre, Vt.—Silica dust.*—The group here consists of 673 workers in the granite industry, and in addition to the regular work, special studies have been begun relating to eye injuries and defective hearing among these workers.

*C. Studies in illumination.*—Studies similar to previous ones were made during the year relative to the efficiency of workers under different degrees of illumination. These studies were also made in the New York post office, as was the first study, but of a larger group of workers. Results of these tests have confirmed the results obtained in the preliminary work and have brought up certain points which need further study before final results can be obtained. In a general way the tests seem to show an increase in production when the illumination was increased, and a decrease in production when the illumination was decreased. Plans have been formulated for the pursuance of this work.

In addition to research work in illumination, a complete survey of the lighting of railway post-office cars was made, and a standard layout of lighting outlets and a standard type of lighting unit was suggested, insuring a better intensity of illumination, a better distribution of the light, and a greater absence of glare for all post-office cars. Illumination surveys were also made in Government buildings, with recommendations for improvement, under the supervision of Physicist James E. Ives.

## II. STUDIES OF OCCUPATIONAL DISEASES

*A. Physical condition of persons engaged in measuring radium emanations.*—The "Preliminary note on observations made on physical condition of persons engaged in measuring radium preparations" was published in Public Health Reports, December 21, 1923.

These observations made by Passed Asst. Surg. R. C. Williams covered a period of approximately one and one-half years and were made on 13 persons employed in the radium section of the United States Bureau of Standards. The results of the second year of the observations will be submitted for publication during the coming year.

*B. Investigations of chemical and physiological aspect of industrial fatigue.*—Studies have been continued during the year as to the effect of high environmental temperatures on the organism. They were under the direction of Physiologist Frederick B. Flinn.

These studies have provided additional knowledge concerning the details of water distribution in the various tissues, the peculiar pathological processes ensuing in different organs, and especially the changes in the constituents of the blood and in the nervous heat-control mechanism. The observations made tend to the theory that there is a progressive breaking down of the nervous control as heat exposure continues. These studies are designed to furnish the scientific basis for future tests and preventive measures to be applied in industries involving exposure to extreme heat.

During the year an investigation was completed of Endden's claim that acid sodium phosphate will increase the muscular work to a marked degree within 24 hours after the administration of sub-laxative doses. Observations were made on some 72 persons, 32 of whom were post-office employees engaged in piecework. Both the increase in production and the general effect of the salt were studied in this research.

With regard to the post-office group, a record was kept of their production and errors which they made, both during the period of administration and for some time before and after. These experiments point to a gradually increased efficiency that apparently resulted from a daily administration of a sub-laxative dose of dihydrogen phosphate.

The greatest increase in this efficiency seemed to occur several weeks after the taking of the phosphate had begun and continued fully a month after the taking of the phosphate had stopped. At the present time the analysis of the data and the comparison between the group taking phosphate and a similar group not taking phosphate is not complete, and a definite statement can not be made at this time as to whether the improvement in efficiency was due to the use of the phosphate itself, or improved body condition due to more regular evacuation of the bowels and the removal of body by-products. A report on this study will appear in the near future.

*C. Posture in industry.*—The posture study outlined in the last report was continued. The first section of this work has almost been completed, approximately 1,800 examinations having been made during the year. As the investigations have progressed it has been believed necessary to extend the study of natural posture further, including an additional group of approximately 1,400 persons, 200 in each 5-year age group from 25 to 60. The preliminary analysis of the data collected shows unmistakably that there is a profitable field for study. Definite types of posture are found, apparently becoming more marked as children grow older. The subject is complicated by the existence of different types of build, the size of the bones, shape of the spine, etc. These types of build must be evaluated before any relation between posture and physical defects

can be established, but it is believed there is a normal posture for each type of build. The posture studies have been carried on under the supervision of Surg. Louis Schwartz.

*D. Chronic carbon monoxide poisoning.*—In cooperation with the Baltimore City Health Department, it was decided to continue the work carried on during the previous year in the study of the extent of chronic carbon monoxide poisoning in certain industries. Lack of facilities made it impossible to carry out this work as planned, so that the only work accomplished in this study during the year has been the study of a small group of garage workers over approximately four months' period. No indications of chronic carbon monoxide poisoning were found in these particular workers, as shown by blood analysis. A slight lymphocytosis was noticed, but up to the present time it has been impossible to determine whether this is due to the occupation or not. As the group under observation was so small and the study was made in only one garage, no conclusions would be justified.

*E. Mercurial poisoning.*—In an investigation conducted in the metallurgical section, chemistry division, Bureau of Standards, it was disclosed that persons engaged in operating electric-induction furnaces suffered from mercurial poisoning. Analysis of the air in the rooms during the operation of these furnaces showed that there was an average of 0.02 milligram of mercury per cubic foot of air; thus, samples taken from the various parts of the room—that is, places where the possibility of mercury having been spilled could positively be excluded—showed that mercury was present in from 1 to 3 per cent. This fact showed beyond the question of a doubt that mercury escaped from the furnaces and was present in the dust throughout the room. When hoods with forced exhaust were installed over the furnaces, the mercury hazard was eliminated.

### III. STUDIES OF THE CAUSES OF INDUSTRIAL ABSENTEEISM

The plan to ascertain from records the amount of time lost in industry on account of sickness and to study the causes of disability, under supervision of Statistical Expert D. K. Brundage, has been extended during the year. At present there are 13 industrial establishments employing 38,000 persons, and four Government establishments with a combined personnel of 10,700, which report currently all cases of disability lasting one or two days or longer. In addition, records of disabling illness are being kept for each of the units engaged in the study of certain dusts, as previously mentioned.

Analysis of the disability data from cooperating companies has shown that the key to the control of sickness frequency lies in the respiratory group, especially colds, grippe, and diseases of the pharynx. About 40 per cent of all the cases of inability to work on account of illness or accident appears to be respiratory, and in January, February, and March the respiratory group usually accounts for nearly 60 per cent of all disability.

Reports are being received monthly of cases of sickness and non-industrial accidents for which sick benefits are paid by 27 different sick benefit associations, and these are tabulated according to sickness causes and published annually. Most of the associations report only those cases which disable for eight days or longer, but these

reports make possible a knowledge of the incidence and duration of the more serious disabilities and afford the only practicable present method of ascertaining current sickness rates on an extensive scale. During 1923 the total membership of reporting sick benefit associations was approximately 100,000. For the calendar year 1924 it is expected that this figure will be increased to 150,000 or 200,000 through the efforts of the National Safety Council, which organization has cooperated with the office of industrial hygiene and sanitation since their congress in Buffalo last October, when a morbidity statistics committee was appointed to assist the Public Health Service in the collection of sickness statistics.

An article based on the reports of sick benefit associations in 1923, now in preparation, shows the extent to which sickness frequency varies in different industrial groups, the seasonal variation in the incidence of different diseases and groups of diseases, and indicates the lines along which public-health work should be directed to effect the greatest reduction in disability. From the wide differences that exist in the sickness rates for different groups of industrial employees it appears that there is considerable latitude for the effective operation of organized endeavor to preserve health and prevent disease. In a paper read before the annual meeting of the American Association of Industrial Physicians and Surgeons at Buffalo in October, 1923, it was pointed out that, on the basis of attained reductions in the sickness rate, expenditures for disease-prevention work could be made profitable investments for industrial mutual associations.

#### IV. STUDIES OF THE USE OF CYANOGEN CHLORIDE AS A NEW FUMIGATION GAS

During the year the cyanogen chloride gas method of ship fumigation was put in operation at San Francisco, New York, Boston, Baltimore, Pensacola, Port Townsend, and the Canal Zone, at which places at least 2,000 ships were fumigated with the new fumigant with good results. Throughout this work the efficiency of this tear gas in giving warning has been proved by the saving of the lives of four persons in addition to affording absolute protection to those engaged in this occupation. Safety in fumigation with this gas was also greatly increased by the compulsory use of the gas masks developed by the Chemical Warfare Service.

Studies which were made on the retention of the cyanogen chloride gas in mattresses after fumigation showed that no toxic concentrations were found unless three times the proper concentration was used.

The purpose of the other experiments made during the year were, first, to reduce the sodium chlorate, and second, to simplify the equipment used at present in the new method, by transporting the gas, under normal pressure, in collapsible rubber containers.

#### V. STATISTICAL OFFICE

Considerable time was given by the statistical office, under the direction of Junior Statistician R. H. Britten, to the preparation of the statistical work in reports mentioned under previous activities.

*Study of the physical examinations of 12,000 workers in various industries.*—The most noteworthy fact yet brought out by the analysis of the physical examinations made in 10 industries in the course of surveys by the Public Health Service relate to racial differences. A pre-

liminary paper on this phase of the study was given at the annual meeting of the American Public Health Association last fall, and was published in the May issue of the American Journal of Public Health.

It is strikingly evident that any study of anthropological or physiological measurements of workers must take account of the racial factor. Among the measurements for which significant racial differences have apparently been found are the following: Height, weight, deviations from average weight for a specific height and age, vital capacity, chest expansion, vision, and pulse rate. No definite racial differences were found in the case of blood pressure. There seems to be a tendency in the case of several measurements for certain racial groups (such as American white, colored, English, Irish, and German) to form a contrast with certain other groups (such as Polish, Russian, Austrian, and Italian). Roughly, the Celtic and Teutonic races tend to show a contrast with the Slavonic and Italic. The former weigh less for the same height and age, are shorter, have a younger age distribution, and show other differences. The contrast in age distribution may reflect primarily the recent change in the racial composition of immigrants.

Many valuable points have been brought out by the study. As an example, it has been shown that there is a marked deterioration of vision at about the forty-fifth year among workers. At present an attempt is being made to discover relationships between vision of adults of different ages, as determined in this study, and the vision of children, as determined in the course of studies in child hygiene. The percentage of persons with normal vision in both eyes actually increases markedly among children, reaching the highest point in the curve, at about 18 or 20 years, then showing a very gradual decrease until about 45 years. After that the deterioration is abrupt.

The extensive nature of the data makes this study of the physical condition of industrial workers of particular interest as there has been little material of like character previously published. But it is realized that the industrial groups are too broad to permit any very definite comparisons as to occupation. Also, the fact that the surveys in each industry were made under different conditions by varying groups of investigators limits the value of the data, especially in regard to physical defects and diseases. Nevertheless, it appears that a bulletin covering broadly the results of the analysis will be a distinct contribution.

*Comparison of efficiency of various dust instruments.*—In cooperation with the United States Bureau of Mines, a study was made of the efficiency of certain instruments for measuring the dustiness of the air.

Silica, coal, limestone, iron metal, and grain dusts were used in the tests. Some of the instruments were more efficient with certain dusts than with others, but on the average the efficiency of the instruments studied, taking the Palmer as 1.0, was as follows:

Instrument	Number of particles	Weight
Impinger.....	5.0	2.1
Sagar tube.....	2.1	1.6
Thimble.....		1.5
Palmer.....	1.0	1.0

The konimeter and dust determinator are not included, although these instruments were also studied. The konimeter was found to be the most efficient of all in very low concentrations, but not to be capable of use quantitatively in high concentrations. The dust determinator gave rather uncertain results.

The impinger, which was developed by Greenburg and Smith during the course of these experiments, employs two principles for arresting and retaining dust in air, namely, (1) impinging under water the air with included dust at high velocity against a plate, the dust being arrested by the wet plate; (2) washing the air bubbles with water to remove dust which has failed to lodge on the plate.

*Study of heat hazard in the glass industry.*—Statistical analysis of the data secured in the survey of the glass industry was postponed in order to make the study of the physical examinations of workers in all of the industries surveyed. Fifteen hundred cards have been punched for the glass-industry survey. Certain classifications have already been made with reference to the amount of water consumed per day and the number of calories of food consumed, on the supposition that these factors have something to do with the effect of the intense heat under which these men work. Also, a preliminary classification of the workers according to the intensity of heat under which they work has been commenced. Classifications will be made according to the wet and dry kata-thermometer readings.

## VI. COOPERATION WITH GOVERNMENT DEPARTMENTS

*Post Office Department.*—Passed Asst. Surg. R. C. Williams acted as liaison officer between the service relations division of the Post Office Department and the Public Health Service in carrying on the following activities: (1) The development of a cooperative plan whereby the post-office employees are accorded the opportunity for physical examination in many stations of the Public Health Service; (2) further tests to determine the most efficient intensity of lighting in post offices, made under the supervision of Physicist James E. Ives in conjunction with Mr. F. W. Farnsworth, of the Post Office, and Mr. Clarence Peterson, of the Supervising Architect's Office; (3) study of lighting in railway-mail cars; (4) special illumination survey of the post-office buildings at Washington and New York.

*United States Bureau of Standards.*—(1) Studies of employees exposed to emanations of radium; (2) investigation of mercurial poisoning of workers in the metallurgical section.

*The Bureau of Mines.*—The studies of mine sanitation are carried on in cooperation with the Bureau of Mines, Department of the Interior, the medical personnel being detailed from the Public Health Service to that bureau for the purpose. Surg. R. R. Sayers is in charge as chief surgeon of the Bureau of Mines. He was assisted in the investigations during the past year by Passed Asst. Surgs. (R.) W. J. McConnell and A. L. Murray, Passed Asst. Surg. C. W. Mitchell, and Acting Asst. Surgs. F. V. Meriwether and F. Flinn, from the Public Health Service, and by engineers, chemists, and other scientific personnel from the Bureau of Mines.

Animal experiments on the effects of long exposure to low concentrations of carbon monoxide were carried out, and are being continued, as no definite conclusions have been reached.

Effective temperatures<sup>7</sup> for still-air conditions and their applicability to mining have been worked out. The results obtained by the use of the kata-thermometer in connection with the studies on the effects of high temperatures and humidities of air in mine workings, as well as in mine, railway, and vehicular tunnels, have been reported, and also the results of experiments on man in still air and in moving air at temperatures above 90° F.

Physical examinations and X-rays were made of about 500 miners and reports have been prepared and submitted to the operators of the mines concerned. Valuable data on the physiological effects of mining conditions on the workmen were collected, and when a large enough number of mines have been studied and sufficient material obtained for drawing definite conclusions a general report on this work will be prepared for publication.

A compilation of the data secured with reference to the death rate due to silicosis and tuberculosis among metal miners in Indiana, Illinois, Missouri, Nevada, California, Colorado, Wyoming, and Arizona indicates that it is much higher than the death rate due to these diseases among coal miners or the general population.

Sanitary surveys were made of mines and camps in connection with observations on dust and ventilation of mines. About six months were spent by the chief surgeon in studying health conditions in the mines of New Zealand, Australia, South Africa, and Great Britain. He prepared a report on the physical factors affecting mining as studied during this trip. The health hazards existing were discussed and the preventive measures in use in the countries were summarized as they relate to metal mines and coal mines.

*Illumination surveys in Government buildings in Washington, D. C.*—These included the Post Office Department building as previously referred to, and investigation of possible eye hazards in the monotype assembling room of the Government Printing Office.

## VII. COOPERATION WITH INDUSTRIAL AND OTHER AGENCIES

*Consulting service.*—For the past several years numerous requests for information and advice have been received from industrial establishments, industrial workers, various State and municipal boards of health, public health and welfare associations, privately operated industrial health bureaus, and Government departments concerning the exposure to industrial hazards, various occupational diseases, and many other questions relating to industrial hygiene and sanitation. This work has increased largely during the present year and forms an important item in the routine work.

*Cooperation with the American Engineering Standards Committee.* The Industrial Sanitary Code, for which the Public Health Service is sponsor, has been completed in tentative form and has been submitted to the committee. All comments, observations, and suggestions relative to changes in the code have been itemized, and it is expected that during the coming year the code as approved by the committee will be published.

The executive committee of the Federal Specifications Board having decided to form a technical committee to consider purchase specifications for safety goggles, a representative of the Public Health Service was appointed to this board from the section of industrial

sanitation and hygiene. In cooperation with the office of child hygiene much work was done on the revised code of lighting school buildings, prepared by the sectional committee on school-lighting code of the American Engineering Standards Committee under the supervision of the Illuminating Engineering Society and the American Institute of Architects.

A committee on the standardization of color terminology having been organized by the Optical Society of America, a representative of the Public Health Service from the section of industrial hygiene was appointed to this committee. It is hoped that the terms and definitions now in use on this subject can be standardized, as at present much confusion prevails.

On the establishment of a committee, of which Prof. D. C. Jackson is chairman, organized under the division of engineering of the National Research Council, to investigate the relation of the quality and quantity of illumination to efficiency in industry, an officer of the Public Health Service from the section of industrial hygiene was appointed to aid in the planning of the research of this undertaking by this committee.

#### PUBLIC HEALTH ADMINISTRATION STUDIES

An office of administrative health practice was established at Baltimore, Md., September 3, 1923, under the direction of Surg. Paul Preble, office space having been provided by the Johns Hopkins School of Hygiene and Public Health.

For a number of years the Public Health Service has been engaged in making health surveys and studies of administrative practice of State and municipal departments of health for the purpose of encouraging and promoting the development of these official agencies. These studies have been undertaken upon requests received from State and local health authorities, and the findings, with recommendations, have been published from time to time. No extensive comparative studies were attempted.

In 1920-21 a survey of the health services provided in 83 of the largest cities in the United States was undertaken by the committee on municipal health department practice appointed by the American Public Health Association. The Public Health Service cooperated in this work and published the results as Public Health Bulletin No. 136. The reception of this report indicated the need for more or less continuous work of this kind in order to keep pace with the progress and changes in municipal health department practice. The Public Health Service, which by virtue of its responsibilities, has a very definite interest in the promotion of national health and has established relations with both State and local health authorities, has established an office of administrative health practice for the continuation of these studies.

These public-health surveys of large groups of cities, in addition to supplying the data necessary for comparative studies of the activities of municipal health departments and evaluations of the various procedures and practices, make possible the collection of material and information that will become most useful and helpful to public-health administrators. It is expected that this information, carefully compiled and presented, will form the basis of a central bureau



of information which will become a clearing house for the exchange of ideas and a helpful service to health officials contemplating some change in the organization or an expansion of the activities of their departments. Out of the collective experiences of selected groups it should be possible to choose those practices that have by trial and experience shown the greatest return for the capital and energy invested.

In order to avoid, as far as practicable, the unnecessary duplication of basic surveys by recognized national agencies, a conference of representative voluntary health agencies, members of the National Health Council, was called to meet at the bureau on December 5, 1923. It was agreed in this conference that the Public Health Service represented the proper central agency for the collection of basic information concerning municipal health departments, with the understanding that the data so collected would become available to interested health agencies.

A schedule was prepared that would embrace, as far as practicable, the information desired by the various health agencies. It was decided to include in the survey all cities having a population of 70,000 or over, making a total of 100 cities. In February, 50 medical officers and sanitary engineers were assigned to undertake the necessary surveys, and at the close of the present fiscal year practically all of the field work had been completed. This survey was confined to the conditions as existing for the calendar year 1923 and probably represents the most extensive study thus far undertaken by personal field visits. It is intended to repeat the field studies from time to time, either by visit or by correspondence, in order to maintain a current record of the group selected, and to extend the surveys to other groups as rapidly as possible.

*Washington County, Md.*—The Washington County health demonstration was continued during the year, with headquarters at Hagerstown. Upon the resignation of Passed Asst. Surg. R. B. Norment, Surg. C. V. Akin was placed in charge of the demonstration in October, 1923. The work during the year comprised the following: Communicable-disease investigations until November, when they were discontinued; smallpox vaccinations; diphtheria immunization and Schick testing; laboratory service, child and school hygiene; public-health nursing; clinics for diagnosis and treatment; and a special study of the dust hazard in the cement industry. The Public Health Service is cooperating in this demonstration with the Maryland State Board of Health, the Washington County Public Health Association, and the Johns Hopkins School of Hygiene and Public Health. The conduct of the work of the demonstration has been greatly aided by the cooperation and services of local and State charitable and welfare organizations and hospitals.

The demonstration in Washington County has afforded excellent opportunities for field investigations in child hygiene, industrial hygiene and morbidity, the results of which are given elsewhere in this report.

## COOPERATION WITH THE JOHNS HOPKINS UNIVERSITY SCHOOL OF HYGIENE AND PUBLIC HEALTH IN EPIDEMIOLOGICAL STUDY OF DIPHTHERIA

The assignment of Surg. W. H. Frost to the Johns Hopkins University School of Hygiene and Public Health as professor of epidemiology in charge of the instruction and research in the department of epidemiology has been continued, and the service has further participated in the epidemiological investigations conducted in this department by the assignment of Passed Asst. Surg. C. W. Mitchell to assist in studies of diphtheria in Baltimore, replacing Passed Asst. Surg. R. P. Sandidge, who was transferred to other duty in July, 1923. The studies in progress comprise the following:

(1) A systematic investigation of all cases of diphtheria reported to the city health department from five contiguous wards of the city, with an aggregate population of about 100,000. This study, which is carried out in cooperation with the Baltimore City health department, has been in progress since the autumn of 1921, and the records so far collected cover about 1,500 cases. A study of the use and efficacy of diphtheria antitoxin in the prevention of secondary infections in the family contacts of diphtheria patients, based upon this material, was published in the Public Health Reports of February 15, 1924, under the title "Is the prophylactic use of diphtheria antitoxin justified?" by Dr. J. A. Doull, of the faculty of the School of Hygiene, and Passed Asst. Surg. R. P. Sandidge. The conclusion reached is that the protection afforded by the prophylactic administration of antitoxin to children in intimate family contact with cases of diphtheria greatly outweighs the dangers inherent in the injection of the serum, and that its more general use under such circumstances is to be advocated. Another report based on this material, "The relation of tonsillectomy to the occurrence of diphtheria and scarlet fever," by Dr. J. A. Doull, is now in press for the Public Health Reports. Additional papers, which will be submitted to the Public Health Service for publication, are now in the course of preparation.

(2) A study of toxin-antitoxin immunization as a measure for the control of diphtheria in an urban area is being carried out in cooperation with the city health department and the department of immunology of the school of hygiene. Approximately 10,000 children from 1 to 15 years of age, residing in three wards of Baltimore, have been Schick-tested during the past two years, and immunizing injections of toxin-antitoxin given to those found susceptible. Active work in testing and immunization was discontinued in December, 1923, but observations on the incidence of diphtheria are being continued for another year or more to determine the effect which these immunizations have had upon the prevalence of the disease in the population of the area. It is already well established that a high degree of protection is afforded to the individuals actually receiving the immunizing treatment, but considerable uncertainty exists as to the effect, if any, upon the residue of the population; and the study is designed chiefly to throw light upon this question which is one of considerable importance in relation to administrative public-health practice.

## MILK INVESTIGATIONS

During the fiscal year 1924 the milk investigations of the Public Health Service were continued under the direction of Associate Sanitary Engineer Leslie C. Frank, with headquarters at Montgomery, Ala.

The work has included the following:

(1) A continuation of the assistance given the State Board of Health of Alabama in executing the state-wide milk sanitation program previously formulated cooperatively with the Public Health Service.

(2) Assistance to other States in a consulting capacity relative to the problem of state-wide milk sanitation.

(3) Assistance to individual cities in organizing their milk sanitation work.

(4) Further studies of the best method of securing the enactment of milk legislation.

(5) Further studies of the best method of insuring the enforcement of milk legislation.

(6) The continuation of studies for the determination of a plan for rating the milk sanitation status of municipalities.

(7) Study of the occurrence of milk-borne outbreaks.

(8) Studies to determine proper specifications for the design of pasteurization machinery.

The progress made in the above-mentioned investigations during the year is given below:

(1) By the end of the fiscal year 1923 two Alabama cities, Tuscaloosa and Gadsden, had passed the standard ordinance previously adopted by the State. During the fiscal year 1924 five more cities passed the ordinance, namely, Montgomery, Mobile, Florence, Huntsville, and Selma. All seven cities have now begun the active enforcement of the ordinance, with the State board of health acting in an advisory capacity.

(2) During the fiscal year 1924 one additional State, namely, North Carolina, adopted the standard state-wide milk-control plan suggested by the service and initially applied in Alabama. A number of visits were made to that State for the purpose of assisting in the formulation and adoption of the plan and in the beginning of its execution. The execution of the plan was not begun until several months prior to the end of the fiscal year, but one North Carolina city, namely, Mount Airy, has already enacted this standard ordinance and is beginning its enforcement.

South Carolina, Virginia, and Texas have officially notified the service of their desire to undertake similar state-wide milk-control work and have requested the aid of the office of milk investigations. The State health officer of South Carolina has presented the standard plan to his State board of health and has recommended its adoption. The States of Virginia and Texas have been advised that the service will be prepared to aid them in a consulting capacity.

(3) From time to time during the year assistance has been given to the cities of Montgomery, Mobile, Florence, Huntsville, Gadsden, Tuscaloosa, and Selma in organizing or carrying out their milk sanitation work. The city of Knoxville, Tenn., also requested and was given assistance.

(4) The enactment of the milk ordinance in seven Alabama cities has resulted in certain conclusions as to the best method of procedure. The experience in Alabama indicates that in promoting the passage of milk legislation it is wise to consult the dairymen, it is unwise to make enactment of the legislation dependent upon their favorable vote, it is wise to acquaint them at the outset with the attitude of the health department on pasteurization, and it is unwise to begin the development of favorable public opinion before informally discussing the proposed ordinance with the city authorities.

(5) The Alabama studies thus far indicate that in order to insure the enforcement of milk legislation it is necessary to provide adequate means for enforcement at a cost which can be borne by the municipalities, and it is further necessary to insure an adequate interest on the part of the local health officer.

The problem of adequate means of enforcement does not usually arise in the larger cities. It appears very frequently in the smaller towns; and there are relatively few small towns in the United States which have an adequate milk control. The Alabama experience has developed a group plan of control under which the State employs inspectors, each of whom enforces milk sanitation in a group or circuit of towns. The Alabama experience has indicated that one inspector can ordinarily supervise the milk-control work in five or six small towns. This plan greatly reduces the expense of milk sanitation which would obtain were each small town to set up its own enforcement machinery, including the necessary laboratory.

The interest of the local health officer in milk sanitation must be both awakened and maintained. The function of the State health department should be to awaken his interest by convincing him of the practicability of the plan of control proposed by the State health department. It is believed that the interest of the local health officer in milk sanitation work can be further stimulated and maintained by the periodic publication of tables showing the milk sanitation status of cities, and that the periodic publication of such municipal milk ratings would result in a stimulation somewhat comparable with the stimulation provided in the grading of dairies. This plan requires, however, the development of a proper method of determining municipal milk-sanitation ratings, which is treated under item 6.

(6) During the fiscal year a method was developed for the determination of municipal milk-sanitation ratings. The method is one which defines the ideal milk supply and then measures the degree to which a city has approximated that ideal. The ideal municipal milk supply is defined as one, all of which is produced in accordance with all of the items of sanitation required for grade "A" raw milk, and all of which is pasteurized in accordance with all of the requirements for grade "A" pasteurized milk. In determining the degree to which any city has approximated this ideal, each item of sanitation has been assigned a credit which is intended to approximate its relative importance. The credits total 1,000. In computing a milk sanitation rating each credit is multiplied by the percentage of the total milk supply of the town which complies with the item in question, the result being the "earned credit" for that particular item. The summation of earned credits for all items gives the total earned credit, and this figure divided by 1,000, the total possible credit, equals the milk sanitation rating of the municipality in question.

It will be noted that the Alabama studies have avoided the measurement of effort expended by the health officer as a measure of milk sanitation. It is believed that the only proper measure is a measure of results. A measure of results is not directly possible in some departments of public-health work, but it is believed to be possible under the plan described for milk control.

(7) During the year a questionnaire study was made of the occurrence of milk-borne outbreaks in the United States during recent years. A study of the results is now being made with a view to publication.

(8) As a result of studies of pasteurization plant design the following specifications for pasteurization machinery have been suggested to and adopted by the State of Alabama.

(a) All approved pasteurization apparatus must be equipped with automatic devices for recording the pasteurization temperature and holding time.

(b) The design of approved pasteurization apparatus must be such that every particle of the milk in or issuing from the apparatus will actually be at or above the officially defined temperature when the attached recording device so indicates.

(c) The design of approved pasteurization apparatus must be such that every particle of the milk in or issuing from the apparatus will have actually been held for at least the officially defined holding time when the attached time-recording device so indicates.

### CHILD HYGIENE

Field investigations in child hygiene were carried on under the direction of Surg. Taliaferro Clark, and included research in special problems of child health and studies of child-health administration. These have been conducted in 21 States and the District of Columbia.

### PHYSICAL DEVELOPMENT

The comprehensive study of the physical development of children was continued from the preceding year, and carried to the point where a large amount of data is now available for the purpose of determining, if possible, a more accurate standard of physical development of children than any now in use. The facts developed through these anthropometric investigations by the service tend to throw considerable doubt on the widely used method of assessing physical fitness through a comparison of the individual child with a weight-height-age table of averages. The work of further analysis and compilation of the data is going steadily forward.

During the year special anthropometric measurements were made in connection with this study in 20 representative cities in 19 States. Special anthropometric data on approximately 27,000 third-generation native-born white children was obtained.

### STUDIES IN ORAL HYGIENE

*Illinois.*—During the first month of the fiscal year the mouth hygiene unit, in cooperation with the State educational authorities, was detailed to summer normal schools in Illinois. Since education

of the teachers in matters of health is fundamental in any school hygiene program, the work of this unit in the normal schools assumes major importance. Instruction in dental prophylaxis and demonstrations of mouth hygiene were given to the teachers and normal students, and the mouths of 144 adults were examined. Since practically all were either teachers or possible teachers, the far-reaching value of the work is readily seen.

*Georgia.*—At the request of the State board of health, the mouth hygiene unit was detailed to the State of Georgia at the beginning of September, 1923. From that time until the close of the fiscal year, in cooperation with health and educational authorities, studies in oral hygiene were carried on in 50 schools in various parts of the State. The mouths of 5,178 children were examined, and 219 clinical cases were treated for educational purposes. Accurate height and weight records were made for each child examined for use in an analysis, already under way, of the effect of dental caries and mouth sepsis on physical status as measured by weight.

In the more than 200 lectures given during this period it was possible to reach not only a large number of teachers and pupils but also many parents, dentists, physicians, and nurses, and the membership of important clubs for both men and women.

#### CHILD HYGIENE IN NEVADA

The studies in child hygiene in Nevada, begun in the preceding year, were continued along the same lines during the fiscal year 1924 and completed in April, 1924.

Owing to the desert conditions in some sections of this State, the investigations were carried on in many instances under great difficulties, but the unit succeeded in reaching every county in the State. Only a few isolated districts could not be reached on account of the impassable roads in winter. All children in school at the time of the unit's visit were examined, and in nearly all communities preschool children and infants were also examined. During the nine months of the past fiscal year, 6,275 school children and 781 preschool children were examined. These data will be used in a study of the relative prevalence of certain physical defects and also as compared with the prevalence of certain defects in other sections of the country. A further use will be made of these data to determine the average physical development of Nevada children in order to compare them with children in other sections of the country.

The intelligent and appreciative assistance of the governor and all cooperating agencies not only facilitated the work of the service but expressed itself in the formulation of plans for the permanent health work of the State. On recommendation of the service the child-welfare division of the State board of health will be reorganized in the interest of more effective service. Plans are under way for the employment of additional trained personnel, and unfavorable conditions of health and sanitation are receiving increasing attention.

#### CHILD HYGIENE IN HAGERSTOWN, MD.

*Scope.*—The child hygiene studies carried on in connection with the Washington County health demonstration were continued

throughout the fiscal year under the direction of Surg. C. V. Akin. In this project the service is cooperating with the Maryland State Board of Health, the Washington County Public Health Association, and the Johns Hopkins School of Hygiene and Public Health.

The scope of the year's work includes:

- (a) Investigations into the effect of intensive health supervision of a group of children during a protracted period.
- (b) A study of the control of communicable diseases in schools.
- (c) A study of absenteeism from school and the causative factors.
- (d) A study of physical development as expressed in annual increments of weight and height.
- (e) Studies in nutrition.
- (f) Studies in the natural illumination of schools.

*Physical defects.*—During the school year, 2,842 children were given complete physical examinations, 1,853 of whom were children who were first examined in 1921–1923. The latter group comprises the children under observation during a protracted period.

An examination, followed by a later reexamination, of a given group of school children should increase the reliability of the statistical record of the defects observed among them; 20.6 per cent of the new entrants, comprising children in the 6-year age group, were found suffering from visual defect, and 19.9 per cent of those reexamined after a year's interval, comprising children 7 to 10 years of age, had defective vision; 6.2 per cent of the new entrants examined had serious visual defect as compared with 6.9 per cent of the older age group.

These observations show that in this group of children, the total amount of defective vision did not increase with advancing school age.

Other physical defects were observed in the following percentages of those examined:

Defective hearing.....	1. 1
Diseased tonsils requiring surgical attention.....	23. 9
Cariou temporary teeth.....	68. 1
Cariou permanent teeth.....	23. 8
Organic heart disease.....	. 4
Simple thyroid enlargement.....	4. 7
Speech defect.....	2. 4

*Communicable diseases.*—In studying methods of controlling communicable diseases in schools, effective cooperation was secured from local health authorities. Through arrangement with the county health officer, prompt notification of the diagnosis, and location of cases of communicable diseases was made to the service officer at the close of each day. A list of such cases as occurred among school children was placed in the hands of each school principal before the opening of school the following morning. The exclusion of home contacts was attended to by the principal as soon as the classes were called to order.

Six hundred and fifty-six successful vaccinations were made during the year, and about 2,000 certificates were furnished children with good scars in order to complete their school records.

*Sickness as a cause of absenteeism.*—But meager information is available regarding absenteeism from school caused by preventable diseases and the related expenditure of school funds without benefit. Records of sickness were kept for 3,712 white school children for the

last six months of the school year 1921-22 and for 5,126 white school children for the entire school year 1922-23 for the purpose of obtaining more exact information on this problem. On analysis it was found that there were 2,333 cases of sickness per 1,000 children per school year, or 2.3 cases per child, with a loss of 7.3 school days per child per school year, or 4.1 per cent of the total possible days of attendance.

The common cold caused the greatest number of cases, as well as the greatest number of days lost from school, with headache and the digestive disorders next in frequency, in the order named, as regards case, but not number of days lost from school. "La grippe" and influenza, tonsillitis and sore throat, and measles each caused considerably more absence than either headache or digestive disorders.

The case rates and the days lost per child were considerably higher for girls than for boys, but the days lost per case of illness were practically the same for each sex.

The duration of a case of illness, as measured in school days lost per case, was found to be greatest for whooping cough, scarlet fever, pneumonia, diphtheria, and measles, in the order named.

The incidence of the diseases more common to childhood was found to decrease very rapidly with age. The incidence rate for tonsillitis and sore throat, headache, and accidents increased up to 11 or 12 years, and then declined. The rate for common colds decreased until about 13 years of age, following which there was a slight increase, while that for toothache and the digestive disorders showed but little tendency to vary with age.

*Physical development.*—At the beginning of the school year a group of 2,958 children was selected for study of physical development as expressed in the annual increments of weight and height. This group, comprising children in the first eight school grades, were weighed at monthly intervals, and their standing and sitting heights were taken in September and February.

*Nutrition.*—Special studies were continued in the school to evaluate, if possible, the various factors concerned in the causation of malnutrition. Forty-two nutrition clinics were held at the unit headquarters, with a total attendance of 2,573, and an average attendance of 61 persons. These included infants, preschool and school children, mothers, fathers, and other adults.

#### STUDIES IN DAYLIGHT ILLUMINATION OF CLASSROOMS

In line with the investigations of the incidence of eye defects among industrial workers, and the efficiency of workers under varying degrees of illumination, mentioned elsewhere in this report, studies in the natural illumination of classrooms were undertaken near the end of the last fiscal year. These studies have been continued on an intensive scale in a selected school at Hagerstown.

Heretofore, the adequacy of the natural lighting of classrooms has been judged largely by the architectural standard of a specified ratio of window glass area to the floor area. It is obvious that this standard is affected by many conditions, such as latitude, season of the year, time of the day, the orientation of classroom windows, and the kind and the amount of overcast. For the purpose of evaluating these modifying influences, hourly observations were made from 9 a. m. to 4 p. m. each day for the entire school year, to include the



amount of desk illumination measured in foot candles, the intensity of the outside illumination, the sky brightness, and the amount of overcast and the type or types of the clouds. Approximately 55,000 observations were made during the year. These data are being rapidly compiled and will be made the subject of a special report.

#### CHILD HYGIENE IN THE DISTRICT OF COLUMBIA

On the request of the director of the Girl Scouts of the District of Columbia, the child hygiene office continued the physical examination of girls and women who registered for attendance at the Girl Scouts' camp. At the close of the year 156 examinations had been made.

#### SURVEY OF MENTALLY AND PHYSICALLY HANDICAPPED CHILDREN

On request of the Illinois State Department of Public Welfare, the Public Health Service is cooperating with the State Institute for Juvenile Research in making a state-wide survey of the mentally and physically handicapped children of the State of Illinois as provided for by the legislature at its last session. This survey, which is under the immediate direction of Surg. G. A. Kempf, is expected to continue for the full duration of the coming fiscal year, and on its completion a joint report will be made to the legislature with recommendation.

Advantage will be taken of this opportunity to secure other data in an attempt to show not only the approximate number of mentally and physically handicapped children in the State, but also the correlation, if any, that may exist between the child's mental status and (1) his physical development, (2) certain hampering physical defects, and (3) his environment including the social, economic and mental status of the parents.

Owing to the close association of the school with the home, and because of the necessity for economizing in time and personnel, this study is limited largely to the school children of several representative counties. Group tests are given in each school visited, following which all children whose intelligence quotient is found to be below 70 are tested individually and also given a thorough psychiatric examination. Children found mentally abnormal are visited in their homes for the purpose of securing additional information that may throw light on their mental condition.

Intensive physical examinations are made and careful records are kept of every child manifesting a departure from the mentally normal. In addition, large numbers of otherwise normal children are examined for the presence of hampering physical defects. The data thus collected will be used, in conjunction with the data collected during the present year on normal children referred to above, in evaluating the hampering effect of certain physical defects.

Thirty-seven schools in Alexander County have been visited and 1,254 children studied. Arrangements were made for a special study of children in State institutions during the summer months, and a total of 290 inmates of the State School for Girls at Geneva, Ill., were examined.

## MENTAL HYGIENE

Field investigations of mental health, under the direction of Surg. W. L. Treadway, were continued during the year. Their scope was limited to the subject of immigration as it relates to the conservation of mental health and to the evolution of mental disorders among the foreign-born population. Owing to exigencies of the service which the field force were required to meet, the continuity of these studies has been considerably broken.

Previous studies conducted by the office of field investigations of mental health showed that the foreign born living in America contributed a very high proportion of mental diseases admitted to public institutions, and that certain types of mental disorders were observed among peoples comprising the "new immigration" and among certain racial groups. In an attempt to understand the causes of these conditions, an epidemiological study of the several types or kinds of mental diseases was begun. The alcoholic psychoses were the first of these diseases to be approached by this method. Observations were made upon the alcoholic admissions to the Boston City Hospital and the records of several public and private institutions were reviewed and analyzed. A report on some epidemiological features in the alcoholic psychoses will be completed during the early part of the next fiscal year.

A study of the records of social agencies, begun during the last year, was completed. The results of these studies were published in the Public Health Reports (March 7, 1924, and April 25, 1924). These inquiries indicate that the records of social agencies generally show a paucity of information regarding the underlying factors of asocial behavior and the conflicts which foreign-born persons experience in an American environment. As a result of these studies, certain theoretical conceptions were made possible regarding the activities of social agencies in this respect. In order to apply these conceptions in a practical manner and to gain further information as to the methods of adaptation of newly arrived foreign-born persons, observations were begun upon newly arrived immigrant families living in greater Boston. The results of these observations, coupled with the results of the previous studies conducted in connection with the social agencies, will be completed some time during the next fiscal year.

Studies of behavior situations among children with special reference to the foreign-born population were undertaken during the fall of 1923 and continued throughout the greater part of the winter. These investigations were conducted at the out-patient department of the Children's Hospital, Boston, where clinical material was made available through the kindness of Prof. K. D. Blackfan, of the department of pediatrics, Harvard Medical School. A number of cases were studied from the standpoint of the attitude of parents and children toward problems arising in the domestic situation, their relationship to the evolution of anomalies in behavior among children, and their influence in the development of nervous symptoms in childhood.

The compilation of an index and an abstract of medical literature dealing with those subjects with which mental hygiene is especially concerned was continued during the past year. A review of the present status of mental tests in relation to personnel employment has been submitted for publication.

## STATISTICAL OFFICE

The statistical office was continued until March 20, 1924, under the general charge of Surg. W. H. Frost, with Associate Statistician S. D. Collins acting as chief statistician in immediate charge, in addition to his duties as statistician for field investigations of child hygiene. Upon the date mentioned Statistician Edgar Sydenstricker, who had been granted leave of absence for 14 months to organize and direct the epidemiological intelligence service of the health section of the League of Nations at Geneva, Switzerland, returned and resumed direction of the office.

Profs. Raymond Pearl and Lowell J. Reed, of the Johns Hopkins University School of Hygiene and Public Health, and Dr. W. I. King, of the National Bureau of Economic Research, New York City, as consultants in statistics, have kept in touch with certain phases of the work of the office and have rendered extremely valuable assistance in the way of advice and criticism. The division of vital statistics of the Bureau of the Census has assisted materially in making available special mortality data and in giving suggestions and advice on certain phases of the work. Close touch was also maintained with the division of statistical research in the Children's Bureau on specific pieces of work in which both offices were interested, and cooperation and assistance were received from several other governmental offices and from other scientific agencies.

The general activities of the office have followed the lines laid down when the office was established in 1920, which were (1) investigations conducted more or less independently by the statistical office; (2) and work in cooperation with other research and administrative units of the service comprising technical advice in statistical procedures and providing the necessary mechanical equipment and clerical staff for tabulation of their data.

## I. WORK OF THE STATISTICAL OFFICE PROPER

*Studies of morbidity among industrial workers.*—Analysis of the records of disability kept by the medical departments of industrial establishments and by employee sick-benefit associations has been continued from the standpoint of studying in a general way all the important factors affecting sickness incidence and severity, and also from the point of view of the effect upon health of the nature of the work and the working environment. The former line of inquiry has been considered as coming within the province of the work of the statistical office, while the latter is of particular interest, of course, to the office of industrial hygiene and sanitation. For this reason the investigations of industrial morbidity have been carried on jointly by the two offices during the past year.

Monthly reports from a group of cooperating industrial medical departments of cases of disability lasting two working-days or longer are being combined into a sort of current index of morbidity, the average frequency of each disease being considered as the "expectancy" for that disease in the month under consideration. By comparing the sickness experience of the employees in each establishment with the average morbidity frequency from month to month,

one can determine the extent to which different diseases are occurring with excessive frequency in any given group of workers. This is important information to those industrial physicians and sanitarians who are interested in the problem of disease prevention. In addition, more detailed analyses of the reports are being made, sickness rates being computed according to sex, age, racial stock, marital status, month of onset, etc., in order to evaluate the influence of these different factors upon the occurrence and duration of sickness.

The reports from cooperating sick-benefit associations cover only the more serious sicknesses and nonindustrial accidents, i. e., mostly those which disable for eight consecutive days or longer. The average frequency of such cases was 95 per 1,000 men in 1923, the male rates in different establishments varying from 48 to 198 cases per 1,000. Among female employees cases of sickness and nonindustrial accidents which disabled for eight days or longer occurred in 1923 at the rate of 128 cases per 1,000 women, the lowest rate for any establishment being 29 cases per 1,000, the highest rate being 261. These data are also being studied from the different points of view mentioned above. Incidentally, they afford valuable actuarial information which in time can be used to place sickness insurance in this country upon more secure financial and mathematical foundations.

An analysis of the morbidity experience of the Flint and Pontiac sick-benefit associations in 1921 and 1922 appeared in the Public Health Reports (April 18, 1924) under the title "Sickness Among 21,000 Automobile Workers." A detailed study of the records of the Employees' Benefit Association of the International Harvester Co. from 1911 to 1920, inclusive, which was begun in 1921, is being continued. From this study it appears that certain nationalities experience more sickness than do other nationalities.

Considerable progress has been made in laying the foundations for future statistical studies of morbidity. At a meeting of industrial medical directors on December 18, 1923, called by Mr. Howell Cheney, of Cheney Bros., South Manchester, Conn., the details were decided upon for making the morbidity data of different companies comparable, and tentative recommendations were made for the classification of the ailments reported. On June 24, 1924, a meeting was called by the National Industrial Conference Board to adapt the international list of the causes of sickness and death to the purposes of industrial morbidity studies. A committee was appointed to work out the technical details of the problem. Subdivision of certain numbers of the international list is being made, and a condensed classification is to be prepared and recommended for general use in the presentation of industrial sickness data as well as records of total morbidity. The general committee expects to report on tentative classifications and on a plan for periodic revisions by a permanently constituted conference representing various national health bodies.

*Study of total morbidity in the general population.*—The field study of morbidity, which was begun in Hagerstown, Md., in November, 1921, was brought to a close on March 31, 1924. The field work was continued under the immediate direction of Acting Asst. Surg. Albert S. Gray, stationed at Hagerstown, in connection with studies of industrial hygiene, until his detail to Luzerne, Pa., when it was continued under the general supervision of Surg. C. V. Akin, stationed at Hagerstown, in connection with studies of child hygiene.

The study was carried on for a period of 28 months and is a series of continuous observations upon a population of between eight and nine thousand persons, of which about 7,200 were the same individuals throughout the period. The tabulation and analysis of the data were begun during the year and some preliminary results were obtained. Preparation of several short papers on certain phases of the results, particularly on respiratory diseases, is in progress, and these papers will be submitted early in the next fiscal year.

The annual sickness incidence rate per thousand population under continuous observations during the 28 months' period was 1,132. This is roughly 100 times the annual mortality rate in Hagerstown for a similar period. The population upon which this rate was based was about 7,200 persons, who were observed almost continuously throughout the period and thus constituted about 16,840 full-time years of exposure. Nineteen thousand and fifty-four cases of illness were recorded in this population, this figure being provisional and subject to slight correction when the final tabulations are made. It is interesting to note that of these 19,000 cases of illness, less than 5 per cent were one day or less in duration, and 75 per cent were three days or longer in duration. Approximately 40 per cent of the cases entailed confinement to bed. The illnesses, therefore, were practically all of a sufficiently serious nature to be more than trivial complaints. Of the total number of cases mentioned above, 11,260, or approximately 60 per cent, were respiratory diseases and disorders. The general distribution of the illnesses observed, according to groups of causes, is as follows:

*Distribution of 19,054 cases of sickness observed among 7,200 white persons of both sexes and all ages in Hagerstown, Md., December 1, 1921–March 31, 1924*

Diagnosis (Numbers refer to international list, 1920)	Per cent
All causes.....	100.0
General diseases (1-10, 12-30, 32-69, 158).....	11.0
Diseases and disorders of the nervous system (70-84, 205) <sup>1</sup> .....	4.1
Diseases and disorders of the eyes and ears (85-86).....	1.8
Diseases and disorders of the circulatory system and of the kidneys and annexa (87-96, 128-134).....	3.2
All respiratory diseases and disorders (11, 31, 97-107, 109).....	59.7
Diseases and disorders of the digestive system (108, 110, 127).....	10.4
Nonvenereal diseases of the genito-urinary system and annexa (135-150).....	3.3
Skin diseases and disorders (151-154).....	2.0
Accidents and other external causes (175-203) <sup>2</sup> .....	3.1
All other diseases and disorders (155-157, 159-174, 204-205) 192 (fatigue only).....	1.5

<sup>1</sup> Including headaches without other symptoms.

<sup>2</sup> Except fatigue.

*Trend of mortality in United States.*—A study was made of the life tables issued by the Bureau of the Census for 1919-20 and for previous periods, and the following conclusions were reached:

(1) Continuation of the general improvement previously noted in expectation of life at birth; (2) a somewhat greater improvement in expectation at birth among colored persons of each sex than among white; (3) an increased length of life among persons of mature age—a group which in 1910 had shown a decrease in longevity; (4) a more rapid decline in mortality in cities than in rural districts; (5) a relatively greater mortality among women, especially at the ages from 20 to 30, than in 1910. A paper covering the results of

this study was published in the Public Health Reports for April 11, 1924.

*Statistical studies of mortality from pulmonary tuberculosis.*—The analysis of statistics of mortality from pulmonary tuberculosis, begun in 1922 by Mr. Sydenstricker, was resumed, and it is expected that some results will be ready for publication during the next fiscal year.

*Statistical studies of mortality from influenza and pneumonia.*—Work was continued on the collection of comparable records of mortality from influenza and pneumonia in a number of foreign countries from 1890 to the present time in order to throw possible light upon the epidemiology of influenza between recognized pandemics. The analysis of the data was under the immediate direction of Junior Statistician R. H. Britten, and the work is in connection with the statistical and epidemiological studies of influenza begun by the service during the epidemic of 1918 and 1919 under Surg. W. H. Frost.

*Studies of statistical technique.*—In connection with the various studies being carried on by the statistical office in cooperation with other offices and units of the service, special attention has been given to the development of methods which are suitable for analysis of different kinds of mass data. Records are kept in the statistical office of all the methods which are used and of the modifications which are made or of such new methods as may be developed, and a series of papers is in preparation for the use of epidemiologists and public health statisticians.

*Course in vital statistics for commissioned officers.*—The practice of including a short but intensive course in vital statistics in the curriculum for medical officers detailed to the Hygienic Laboratory for instruction was continued. One such course was given this year. The course consisted chiefly of supervised work on assigned statistical problems with lectures. It was necessarily a short course but was sufficient to give a working knowledge of elementary principles and methods.

## II. WORK IN COOPERATION WITH OTHER ORGANIZATIONS OF THE SERVICE

In accordance with the purposes in view when the statistical office was established, a large part of its work consists not in conducting independent investigations but in rendering assistance to other units of the service in carrying out statistical phases of work for which they are responsible. This cooperation comprises:

- (1) Technical advice and criticism in matters of statistical procedure, including the preparation of record forms, punch cards, and tabulation forms, and in some instances collaboration in the preparation of reports for publication.

- (2) The assignment of statistical personnel to undertake or to assist in statistical analyses incident to the work of other units.

- (3) The use of the mechanical equipment and operatives of the statistical office for tabulations or computations involving the use of mechanical appliances, the statistical office assuming responsibility merely for making the tabulations and computations required, not for the ultimate analyses or interpretation of the results.

The units of the service to which the statistical office has rendered more or less extensive service during the past year include the following: Field investigations of child hygiene, industrial hygiene, pellagra, and minor respiratory diseases; also the statistical units of the division of marine hospitals and relief, the division of sanitary reports and statistics, and the division of venereal diseases. The work done in connection with these independent activities has so far been, both in value and in importance, the major work of the statistical office.

*Child hygiene.*—An analysis was made of the physical measurement of children who at the time of the examination or within two years prior to that time had had malaria, in comparison to children from the same community who did not have malaria and had not had it within two years past. The children were from Dunklin County, Mo., where considerable malaria is present. With the available data no appreciable difference was shown between the mean measurements of children of a given age and sex who had had malaria and those who had not had malaria.

A report has been prepared on absence from school on account of sickness in Hagerstown, Md. This report analyzes absence according to sex, age, cause of illness, month of onset, etc. It will shortly be submitted as a separate report on this subject.

Work was continued on the study of the weight of school children in relation to nutrition as judged from clinical evidence. Certain reports have been published to show the weakness of certain standards of nutrition (Public Health Reports, June 8, 1923, and March 14, 1924). The tabulation of considerable anthropometric data is now under way to determine whether any measurements or ratios of measurements which are simple enough to be used in ordinary school health work are sufficiently correlated with nutrition to be used as a means of judging the nutrition of a given child.

A report was prepared and published (Public Health Reports, June 27, 1924) on the past incidence of the common communicable diseases in a group of about 35,000 school children 5 to 19 years of age. It was found that by the nineteenth year of age about 89 per cent of the children had had measles, 78 per cent whooping cough, 65 per cent mumps, 52 per cent chicken pox, 12 per cent scarlet fever, and 9 per cent diphtheria.

*Minor respiratory diseases.*—In cooperation with investigations of minor respiratory diseases, the statistical office has rendered assistance in detailing clerical and technical personnel and in preliminary tabulations and analysis of records so far made. In a general way it has also assisted in planning the forms used and in other statistical phases of the study.

*Hospital division.*—The statistical office has occupied an advisory relation to this unit, rendering assistance and advice when called upon.

*Pellagra.*—Upon the return of Mr. Sydenstricker, three papers dealing with the results of field studies of pellagra in South Carolina were prepared, two dealing with the incidence of disabling sickness among cotton-mill workers, and one with the income cycle in the life of the wage earners as determined in 1917 in a large mill-working population in South Carolina. The completion of certain statistical phases of the pellagra investigations was also undertaken by Mr.

Sydenstricker in collaboration with the office of field investigations of pellagra.

### STREAM POLLUTION

Investigations of the pollution of streams and of associated problems relating to the purification of water supplies and the disposal of sewage have been continued under the general direction of Surg. W. H. Frost, stationed at Baltimore, Md., with Sanitary Engineer J. K. Hoskins in immediate charge of the laboratory and field work, which is based at Cincinnati, Ohio.

Dr. Stephen A. Forbes, of the State Natural History Survey of Illinois; Dr. Edwin O. Jordan, of the University of Chicago; Mr. Langdon Pearce, of the Sanitary District of Chicago; and Mr. Earle B. Phelps, consulting sanitary engineer, of New York, have continued to serve as consultants, reviewing the work in progress, advising as to its extensions, and giving most generously of their time on various matters referred to them individually. Mr. Joseph W. Ellms, of Cleveland, Ohio, who was appointed during the previous year as a special consultant in matters relating to the purification of water supplies, has been especially helpful in the advice which he has given regarding the construction and operation of an experimental filter plant.

As the problems under investigation are mostly of such broad, general character as to require some years of consecutive study to achieve any important result, work has been continued along the same general lines as in the preceding year, with little change in the personnel and organization.

*Reports on pollution and natural purification of the Ohio and Illinois Rivers.*—Precedence has been given in the year's work to the preparation of reports upon studies of the Ohio and Illinois Rivers, the field work of which had already been completed in previous years. The first report on studies of the Ohio River, dealing only with one phase of the work, was published during the fiscal year 1923, as Public Health Bulletin No. 131, "A study of the pollution and natural purification of the Ohio River: I. The plankton and related organisms." In March, 1924, the second and principal report, "II. Report on surveys and laboratory studies," was submitted to the bureau for publication, and is now in press as Public Health Bulletin No. 143. The series has since been completed by a third report, "III. The phenomena of oxidation and reacration," which was submitted for publication in June, 1924, and is also now in press as a Public Health bulletin.

A report on studies of the Illinois River, which was expected to be ready for publication during the year, has not been completed, owing to various unforeseen difficulties and interruptions; but analyses of the data have been carried to the stage where their general import and relation to observations on the Ohio River have been established.

One of the main purposes of these two studies has been to investigate the laws governing the natural purification of streams. As regards bacterial purification this purpose has been achieved to the extent that the decrease in bacteria has been shown, both in the Ohio and in the Illinois Rivers, to follow a definite and orderly course which may be described approximately by fairly simple mathematical formulæ. The phenomena in the two streams are



not identical, but are sufficiently similar to indicate the probability that they follow the same general law, which as yet can be expressed only empirically. With respect to oxidation and reaeration, the studies on the Ohio indicate that these reactions proceed at rates which are related in a definite way to temperature and to certain physical characteristics of the stream. Observations on oxidation and reaeration in the Illinois have not yet been fully analyzed, but appear to be consistent with the conclusions provisionally derived from the Ohio River data.

It remains now to check these observations on other streams in order to test the generality and practical application of the indicated laws of natural purification. It may be said, however, that completion of the studies of the Ohio and Illinois Rivers, together with the earlier study of the Potomac River, completes the first stage in the general program of studies of stream pollution inaugurated by the service in 1913.

*Experimental studies of natural purification.*—The next step in the plan of continued study which is being pursued is to determine more precisely the physical and biological conditions which govern the rates of natural purification in streams. Considerable effort has therefore been devoted during the past year to experimental studies of natural purification.

With respect to the experimental study of bacterial purification, a difficulty which has not yet been overcome is that the changes which take place in polluted water stored in small containers adapted to experimental study are not identical with those which take place in the stream from which the samples are taken, under similar conditions of temperature, agitation, light, etc.; hence, the results of small-scale experimental studies are not directly applicable to natural streams. In order to reproduce river conditions as closely as possible, an experiment station was established in May, 1923, at Fernbank, on the Ohio River, immediately below the Cincinnati metropolitan district, using laboratory space furnished by the district engineer's office, in one of the buildings on the Government reservation at Dam No. 37, and was continued in operation until October, 1923. Here a long series of observations was made by Associate Bacteriologist C. T. Butterfield and a technical assistant, on samples of river water stored in bottles and in collodian sacs, some of which were suspended in the river to insure that conditions of temperature and light should be identical with those in the stream. The results of this study and of its continuation during the winter at the Cincinnati laboratory have so far been negative in that all attempts to reproduce experimentally the changes known to take place in the river have been more or less unsuccessful. The work has served, however, to indicate more clearly the direction of future efforts, and the studies are being continued.

Associate Chemist E. J. Theriault has conducted a series of experiments to test the precision of methods for the determination of dissolved oxygen and of the biological oxygen demand of polluted river waters. A partial report on this work was submitted at the close of the fiscal year in a paper on "The determination of dissolved oxygen by the Winkler method," which will be presented for publication in the near future. Studies of the laws governing the satisfaction of biological oxygen demand are still in progress, but have already

yielded some results which are believed to be of distinct importance in explanation of the reactions.

*Collective and experimental studies of water purification.*—Under the direction of Sanitary Engineer H. W. Streeter, studies of the efficiency and cost of water purification in relation to the pollution of the raw water have proceeded along the lines indicated in the annual report for the preceding year.

Early in the fiscal year arrangements were made with the operators of 17 carefully selected municipal filtration plants whereby each would render detailed reports of operating conditions and of daily examinations of raw and treated water. The plants contributing to this study are widely distributed in the Central and Middle Atlantic States, special attention having been paid in their selection to the quality of water treated, the methods of purification used, and the uniformity and precision of laboratory examinations. Each plant will furnish records for a full year, and as the reports were begun at various times during the summer and autumn of 1923 the records will be completed at corresponding dates in 1924. Basic tabulations of the data are made as the reports are received, but critical analysis of the results will probably require a year's work after the reports have been completed.

An experimental filter plant, the plans for which had been drawn up in the preceding year, was completed in March, 1924, and, after thorough tests and adjustments, is now in operation. The plant consists of two rapid sand-filter units, with coagulating basins and apparatus for chlorination. It is located on the grounds of the Cincinnati laboratory, with an intake in the Ohio River, several hundred yards distant. As one of the purposes in view is to determine the relation of operating costs and efficiency to varying degrees of pollution, connections have been provided whereby the pollution of the raw water may be increased by the addition of ripened sewage, or decreased by dilution with filtered water from the city supply, thus affording a wide range of operating conditions. During the next year and as long thereafter as may prove advantageous, it is proposed to operate the plant under systematically varied conditions of loading and treatment, thus checking and supplementing the data assembled in the collective study of municipal filtration plants.

*Studies of the physical chemistry of coagulation in water purification.*—Asst. Chemist L. B. Miller has been continued in his assignment to the Hygienic Laboratory, working, under the direction of Prof. William Mansfield Clark, on studies of the physical chemistry of coagulation in water purification. Two reports on the results of these studies have been published during the year, namely, "On the composition of the precipitate from partly alkalized alum solutions" (Public Health Reports, August 31, 1923), and "Adsorption by aluminium hydrate considered as a solid solution phenomenon" (ibid., June 20, 1924).

*Survey of phenol wastes as affecting public water supplies in the Ohio Valley.*—At a special conference of State health authorities with the Surgeon General, in May, 1923, a formal request was made that the service undertake a survey of the situation resulting from the pollution of streams with wastes from by-product coke ovens and certain other industries producing wastes containing phenols, which, even in very small amounts, produce extremely disagreeable taste

and odor in chlorinated water. In compliance with this request, Sanitary Engineer H. R. Crohurst was assigned in December, 1923, to make a survey of the Ohio Valley and adjacent territory, this being the region in which water supplies have been most seriously affected.

Information was collected from State health authorities and from other available sources as to the location and character of plants discharging such wastes, the processes of recovery used, and the public water supplies affected, and this information was embodied in a report submitted to the Surgeon General in March, 1924.

In the meantime, at a conference with the Surgeon General, on January 29, 1924, the health authorities of the States lying in the Ohio Valley had formed an interstate association for the purpose of concerted action in eliminating these objectionable wastes from the Ohio River system. The service report was therefore transmitted by the Surgeon General to the secretary of this association for distribution among its members.

On April 14, 1924, a conference of the above-mentioned State health authorities with representatives of industrial plants producing phenol wastes was called at Pittsburgh, Pa., by Dr. John E. Monger, commissioner of health of Ohio, as chairman of the interstate association, and was attended by Surg. W. H. Frost and Sanitary Engineer H. R. Crohurst, as representatives of the Public Health Service. At this conference plans were made for cooperation between State health authorities and industrial concerns for eliminating phenol wastes from streams used as sources of water supply, and it was agreed that if further studies by the Public Health Service should be required a request would be made by the States forming the association.

*Miscellaneous activities.*—At the request of the Director of the Veterans' Bureau, Sanitary Engineer H. R. Crohurst was detailed, in April, 1924, to make a survey of the water supply of Veterans' Hospital No. 91, at Tuskegee, Ala., and upon completion of this duty submitted recommendations through the Surgeon General.

In connection with a survey of the pollution of streams within the State of Ohio by the State department of health, detailed records of surveys made in that State in the course of the Ohio River investigation have been made available to the State health authorities. Reports on surveys of mining towns, likewise made in connection with the Ohio River investigation, have also been furnished to the commission investigating conditions in the coal industry.

A request having been made by the sanitary authorities of Illinois, Indiana, and the sanitary district of Chicago that the Public Health Service participate in a study of the pollution of the lower end of Lake Michigan as affecting the water supplies of cities in Illinois and Indiana, Surg. W. H. Frost was detailed in June, 1924, to visit this territory, confer with the authorities, and make a preliminary survey to ascertain the scope of investigation required. Action upon the report rendered is under consideration at the close of the fiscal year, pending the completion of plans proposed for a joint study by the local and State authorities and the Public Health Service.

## EXCRETA-DISPOSAL STUDIES

The work of previous years having surveyed this field and delimited the problems concerned, it became necessary on account of financial limitations to reduce the program to a few topics, the pursuance of which seemed most promising of scientific and practical results.

The most important of these is the ground water carriage of fecal contamination. As has been reported in a preliminary publication, the possibility of transfer of intestinal organisms to hitherto unsuspected distances, over previously unheard-of periods of time, and in accordance with natural laws which have now been formulated for the first time, has been successfully demonstrated. Observations bearing on these factors have been continued, and the tabulations of the work up to the present time show a total of 490 wells with 8,269 water samples which were bacteriologically examined. These examinations have yielded the information that the ground water may show definite indications of contamination by the uranin test up to a distance of at least 345 feet from the point of contamination, and by the *B. coli* test up to 190 feet. Further determinations may extend these figures. These observations were made in sandy soil and were most carefully controlled.

Experiments have also been continued on the viability of *B. typhosus*. One liter of a composite culture, made up of 6 strains of *B. typhosus*, was placed in each of several sand rings in an otherwise unpolluted experimental pit. The bacteria were recovered from the sand up to and including the thirty-eighth day, the experiment being then discontinued.

At Washington, D. C., corresponding quantities of the same cultures of *B. typhosus* were poured into four experimental rings of a pit, each ring with a special type of soil, namely, (1) mixed gravel; (2) average garden soil; (3) richest, highly fertilized garden soil available; (4) average gravel. To date (June 25, 1924) *B. typhosus* has been recovered from all four rings at various dates; in at least one ring it has been recovered up to 198 days.

## LEPROSY INVESTIGATION STATION, HONOLULU, HAWAII

The activities of the leprosy investigation station at Kalihi Hospital have been carried on in cooperation with the Territorial Board of Health, Surg. H. E. Hasseltine, assisted by Surg. P. J. Gorman, having full charge of the medical work of the hospital.

At the beginning of the fiscal year there were 145 patients in the hospital and at the end of the year there were 139. During the year 89 were admitted, 39 were paroled, and 7 died, 4 of these succumbing to tuberculosis. In January, 1924, 49 patients were transferred to the Molokai Settlement. This transfer was made primarily for disciplinary reasons, 20 of this number having broken hospital rules and regulations, in some cases, repeatedly. Ten were transferred at their own request and 19 were advanced cases that showed little or no improvement under treatment. There being no means of bringing a case into court in the hospital, it was necessary to transfer such offenders to Molokai, where there are court facilities.

With the exception of a few patients whose physical condition had been so poor that treatment by intramuscular injection was not advisable, all patients received treatment with the ethyl esters of the fatty acids of chaulmoogra oil, or some closely allied preparation.

The majority received the mixed esters of the fatty acids of chaulmoogra oil with 1 per cent of iodine added. The use of the iodine lessens local reaction and seems to promote better absorption.

A small group of patients were treated with amino-arseno-phenol (eparseno) early in the year, following the report, by certain French workers, of excellent results obtained with this preparation. The results obtained at this station were disappointing.

A compound of arsenic with ethyl esters of the fatty acids of chaulmoogra oil, prepared in the laboratory of the University of Hawaii, was tried on a small group of patients. The first patient receiving it showed remarkable improvement within a month, but others failed to respond. This one favorable result is attributed to some individual peculiarity of the patient, as occasionally one is found who responds quickly to treatment with ethyl esters. Also, a compound of ethyl esters with mercury has been prepared and is being used on a small group of patients. Thus far there is nothing to indicate that either of these compounds gives any better results than the mixed ethyl esters.

Another small group has received the ethyl esters of the fatty acids of the oil expressed from the seed of the gorli tree, which contains more chaulmoogric acid and less hydnocarpic acid than does chaulmoogra oil. From a chemical standpoint, gorli oil should be a fair substitute for chaulmoogra oil in case of a shortage of the latter. All the patients receiving the ethyl esters of the fatty acids of the gorli oil have continued in practically the same condition, with one exception, who recently seems to have become worse and has been returned to the standard chaulmoogra treatment. This change is not necessarily chargeable to the gorli preparation, for, considering the peculiarities of the patient, it might have happened under treatment with any preparation.

Late in the fiscal year a small group was placed upon the thymol and cod-liver oil treatment as advocated by Hamza. Another group was placed on the ethyl esters of cod-liver oil. It is too early to draw any conclusions as to the therapeutic merits of these preparations.

Summing up all therapeutic investigations, it may be stated that thus far we have found no preparation that gives as good results as our standard treatment, viz, mixed ethyl esters of the fatty acids of chaulmoogra oil with 1 per cent of iodine added.

A change in dosage has been made which seems to have given better results, viz, a reduction of the maximum dose from 5 cc. to 3 cc. Since the smaller doses have been employed, the general improvement in many cases has become quite noticeable and, considering the hospital population as a whole, the prospects for parole appear brighter now than at any time in the past three years.

An attempt to produce leprosy in rabbits by intratesticular inoculation with leprous material, which was begun in 1922, was terminated by the death of the animals about 15 months after inoculation. No evidence of leprosy could be found in the animals.

In September, 1923, two leprous nodules were removed from patients and buried in the ground under conditions approximating those of a body interred in the usual manner of burial. At the end of one, three, six, and nine months bacteriological examinations revealed acid-fast organisms when stained and examined in the usual manner. Up to and including six months, the appearance of the organisms corresponded with that of *B. lepræ*. At nine months the characteristic

arrangement was lost, though the acid-fast property was retained. The number of organisms showed little, if any, decrease. Whether the organisms were viable or not can not be stated. These observations confirm those of Arning reported in 1885.

A comparative study of the Ziehl-Nielsen and Schulte-Tigges methods of staining acid-fast bacilli, as applied to the search for *B. lepra*, showed that the Ziehl-Nielsen method was slightly preferable.

Late in the year chemical research on cod-liver oil and its possibilities for use in the treatment of leprosy was begun in the chemical laboratory.

A study of the histories of children born of leprous parents in the Molokai Settlement has been made and will be submitted for publication in the near future. Manuscripts reporting the results of studies on the Wassermann reaction in lepers and on the treatment of leprosy by antimony compounds and chaulmoogra derivatives were submitted for publication during the fiscal year.

### HYGIENIC LABORATORY

The work of the Hygienic Laboratory has continued under the direction of Surg. G. W. McCoy and Passed Asst. Surg. R. E. Dyer, the assistant director.

One class of six student medical officers was under instruction for a period of six months. The course of study is being changed constantly with a view to better utilization of the time of the men under instruction and a satisfactory schedule was covered. A considerable number of workers from laboratories in the United States and abroad have had the facilities of the Hygienic Laboratory made available to them.

*Interchange of students with European laboratories.*—Under the auspices of the health section of the League of Nations, and in accordance with the program of that section for the interchange of students of public health between this country and the European nations, two of the officers stationed at the Hygienic Laboratory were authorized to spend a period of four months at study in the research laboratories of Europe.

The major part of the time was spent at the Staatens Serum Institut, in Copenhagen, Denmark; the Institut für Schiffs-und Tropenkrankheiten, in Hamburg, Germany; and at the Pasteur Institute, in Brussels.

During this period the international conference on the standardization of the serological diagnosis of syphilis was attended. This conference was held at Copenhagen and was attended by representatives from most of the leading laboratories of Europe.

After the conclusion of the studies at the laboratories previously mentioned, some time was spent in visiting other noted laboratories in Europe.

It is felt that the tour of study in foreign laboratories is quite valuable in the training of officers for research. New ideas are gained, and new problems and new methods of studying old problems related to disease affecting the public health are encountered.

During the period that the United States Public Health Service officers were studying in Europe, representatives from the Staatens Serum Institut, in Copenhagen; the Institut für Schiffs-und Tropen-

krankheiten, in Hamburg; and Laboratoire de l'Administration de l'Hygiene, in Brussels, were spending a like period in the laboratories of America, their time being divided between the Hygienic Laboratory in Washington, the Public Health School at Johns Hopkins University, Baltimore, the New York State and City Laboratories, the Rockefeller Institute, and others.

*Library.*—During the fiscal year 1923–24, 605 bound volumes were added to the library, making a total of 10,880. More than 3,000 Library of Congress cards, in addition to unnumbered manuscript cards, were added to the catalogues. Volumes borrowed from other libraries numbered 1,652, and 101 volumes were lent to other libraries. Current periodicals to the number of 233 were received, and some 62 reports, bulletins, etc., of State and municipal health departments; 2,891 bibliographic references were prepared, and a number of photostat copies of miscellaneous articles were made, both for the laboratory staff and for the field service.

#### DIVISION OF PATHOLOGY AND BACTERIOLOGY

Surg. G. W. McCoy continued in immediate charge of the division, as in the past.

The plan of detailing officers in charge of sections, as heretofore, has resulted in such a satisfactory systemization of the divisional work that it has been continued. The chiefs of sections during the fiscal year just closed were: Surg. Joseph Goldberger, section on nutritional diseases; Surg. James P. Leake, section on infectious diseases; Surg. G. C. Lake, section on pathology.

*Biological products.*—The usual inspections of domestic manufacturing laboratories have been made. The plan has been adopted of conducting the annual inspection of the eastern establishments in the autumn and that of the western plants in the spring. This distributes the testing connected with the inspections over a longer period and avoids the congestion of samples which occurred under the old system of making all the inspections at approximately the same time. It also has the advantage of requiring a less prolonged absence of the inspecting officer at any one time.

Passed Asst. Surg. W. T. Harrison had charge, as in the preceding fiscal year, of the inspectional and testing work connected with enforcement of the biologics law.

Inspection of European laboratories holding licenses, as well as of those laboratories which had applied for new licenses, was made during the spring of 1924.

In May, 1924, the director attended, in the capacity of consultant, the meeting of the permanent standards committee for the standardization of sera and serological tests of the League of Nations. The meeting was held at the Pasteur Institute, Paris, France. This international committee took action with respect to establishing standard dosages of diphtheria antitoxin (1,000 units prophylactic, 5,000 and 10,000 units therapeutic) and reported that work was in progress on an attempt to establish a new unit for tetanus antitoxin. Consideration was given also to the standardization of antipneumococcic, antimeningococcic, antidysenteric, and antistreptococcic serums, but there was general agreement that sufficient data on which to base action are not available at the present time.

A movement is in progress to provide for international recognition of licenses for establishments manufacturing biological products. The Office International d'Hygiene Publique has already taken action with respect to the international recognition of licenses for antidiphtheritic serum, and this will doubtless be followed by similar action on other products. The United States requirements in general are so much higher than those of foreign countries that it would appear to be unwise to enter into any arrangement which would involve modification of the present United States law or regulations.

The ever-widening and constantly changing field of utilization of biological products is continually bringing up new questions for solution; for example, the recent work on the prophylaxis and treatment of scarlet fever presents the necessity for the standardization of antistreptococcic serum and the toxins produced by certain streptococci.

The work on the use of diphtheria toxoid, which seems likely to replace, to some extent, the toxin-antitoxin mixture, will require standardization of the former agent. The utilization of measles immune serum makes it necessary to provide safeguards for this particular preparation.

Tests on biologic products were made during the year; the following tabulation gives the data in detail.

*Examination of biologic specimens*

**Sterility tests:**

Diphtheria antitoxin.....	85
Tetanus antitoxin.....	47
Botulinus antitoxin.....	15
Antipneumococcic serum.....	59
Antimeningococcic serum.....	86
Antidysenteric serum.....	11
Antistreptococcic serum.....	9
Tuberculin.....	29
Rabies vaccine.....	47
Vaccine virus.....	31
Pollen extracts.....	110
Antityphoid vaccine.....	50
Diphtheria toxin antitoxin mixture.....	372
Diphtheria toxin for Schick test.....	10
Miscellaneous serums.....	41
Miscellaneous vaccines.....	313
Total.....	<u>1,315</u>

**Potency tests:**

Diphtheria antitoxin.....	91
Tetanus antitoxin.....	48
Botulinus antitoxin.....	9
Rabies vaccine.....	15
Diphtheria toxin antitoxin mixture.....	384
Diphtheria toxin Schick test.....	136
Antipneumococcic serum.....	33
Antimeningococcic serum (agglutination).....	102
Antimeningococcic serum (tropin).....	63
Antidysenteric serum.....	24
Antityphoid vaccine.....	50
Vaccine virus.....	6
Miscellaneous serums.....	6
Total.....	<u>967</u>

Grand total..... 2,282



## SPECIAL INVESTIGATIONS IN THE LABORATORY

*Tularæmia*.—Owing to the dissemination of knowledge of this disease, secured by Hygienic Laboratory researches under Surg. Edward Francis, its recognized areas of distribution in the United States have been enlarged to comprise 10 States and the District of Columbia.

During the past year the infection was found in wood ticks of the species *Dermacentor andersoni* Stiles, collected in nature in the Bitter Root Valley, Mont., and ticks infected in the laboratory were found to convey the infection to guinea pigs on which they fed one year after the date on which they were experimentally contaminated. Ticks of this species feed on man, and one proved human case of tularæmia due to tick bites has been reported from Montana.

*Tuberculosis*.—Work on this subject has been resumed during the past year under the immediate direction of Pathologist William Charles White. The researches have been based upon the relation of tubercle bacillus infection of (1) the epithelioid cell which makes up the major portion of the tubercle, and (2) the reticulum and white fibrous tissue, new formations of which are abundant in the tubercle and are the remaining elements of scar in the animal which has recovered from the infection. This work has been carried on in conjunction with the division of pharmacology.

Several alleged cures for tuberculosis have been tested on experimental animals, but in each case results were negative so far as favorable influence on the process was concerned.

Part of the work under this subject has been devoted, in conjunction with other agencies, to organizing and correlating the tuberculosis research in the United States on a national program.

The main portion of the work now under way is on the chemical analysis of the tubercle bacillus and the purification and standardization of tuberculin. Other conferences, however, have been held and work commenced in different laboratories on the anatomy of the lungs, normal X-ray standards, the biology of the tubercle bacillus, and the origin and function of the epithelioid cell.

*Pneumonia*.—During the year work has been carried on in attempts at active immunization of monkeys against pneumonia by means of intratracheal injection, on the treatment of experimental pneumonia by means of modified serum, and on the fate of pneumococcus antibodies in the animal economy.

An analysis of over 2,000 cases of lobar pneumonia is in progress with a view to establishing the relation of type of infection to age, sex, clinical picture, and death rate.

*Malta fever*.—Little work has been done on this subject during the year, chiefly because the two workers engaged on it developed the infection, which, in each case, incapacitated the individual for work for a large part of the year.

The Hygienic Laboratory has suffered from the infection of three of the personnel, one case of infection having occurred in the preceding year, in the course of the Malta fever investigations, later involving several months of serious invalidism. This experience is by no means unusual, since it is well recognized that there is scarcely any more hazardous field of investigative work than that dealing with Malta fever.

A culture of *Brucella melitensis* received in May from Sioux Falls, S. Dak., was classified according to the agglutinin absorption test. This yielded important results, confirming the view that the organism causing contagious abortion in cattle belongs to the same bacterial species as that causing Malta fever in goats and in man. The patient's history showed no possibility that he could have contracted Malta fever from goats. The strain agreed serologically with that group which is responsible for the majority of bovine and porcine infections in this country. This is the third case (all reported in 1924) on record of Malta fever due to infection with the *abortus* type of *Br. melitensis*.

Strains of *Br. melitensis* isolated from the blood of two laboratory cases of Malta fever were "typed" by the agglutinin absorption test and were found to be identical with the strains received from cases of Malta fever which occurred during the Phoenix epidemic, to which reference was made in the previous annual report.

*Trachoma—Studies on the etiology of trachoma.*—A branch laboratory in charge of Associate Bacteriologist Ida A. Bengtson has been established at the Missouri School of Mines and Metallurgy (department of hygiene), Rolla, Mo., where investigations have been begun with a view to determining the causal agent of trachoma. Material is obtained from the trachoma hospital maintained by the United States Public Health Service at Rolla, where cases requiring hospital attention are received, and also from clinics conducted by the Public Health Service in cooperation with the Missouri State Board of Health in parts of the State where trachoma is more prevalent.

*Narcotic drug addiction.*—The studies on the prevalence of drug addiction which were started during the previous year were continued, the investigations being under the immediate direction of Surg. Lawrence Kolb, assisted by Pharmacologist A. G. DuMez. An officer of the service visited different sections of the country to study local conditions, to interview physicians, and to examine addicts. Surveys on the prevalence of drug addiction in different parts of the country and of selected groups were analyzed and statistics were compiled showing the amount of narcotics imported into the United States for every decennial period since 1860. Reports of the officers engaged in the work show that the incidence of drug addiction increased until the period 1890–1899 and has steadily decreased since that time. In recent years the actual number of addicts has decreased in the face of an increasing population. It is concluded that during the period of greatest prevalence there may have been 264,000 addicts in the country, while 150,000 is estimated as the maximum number at present, and the actual number to-day is believed to be substantially less than this.

## ROUTINE WORK

The routine work of the laboratory is shown by the following tabulations:

*Clinical work*

Typhoid vaccine administered.....	76
Physical examinations.....	51
Smallpox vaccinations.....	38
Antirabic treatment.....	4
Schick test.....	29
Diphtheria toxin-antitoxin mixture administered.....	19
Personnel treatments.....	56
Hay-fever treatments.....	60
Total.....	333

*Specimens examined*

Heads, for rabies.....	65
Sputum.....	22
Urine.....	125
Tissue.....	199
Cultures.....	284
Water.....	159
Smears.....	31
Wassermanns.....	3, 653
Milk.....	5
Blood counts.....	69
Miscellaneous.....	159
Total.....	4, 771

## DIVISION OF ZOOLOGY

The professor of zoology, C. W. Stiles, has spent much of his time as chairman of the board on excreta disposal. (See p. 52.)

*International commission on zoological nomenclature.*—Cooperation with the International Commission on Zoological Nomenclature has continued in the same manner as in preceding years.

*Index catalogue of medical and veterinary zoology.*—The entries in the Host Catalogue, up to current literature, have been completed and the manuscript for the mammals is well under way.

*Examination for diagnosis of intestinal parasites.*—This part of the routine work of the division has been continued throughout the year. Specimens have been examined for the National Training School for Boys, for various Government hospitals, State boards of health, universities, and for practicing physicians.

## DIVISION OF CHEMISTRY

*Studies on oxidation reduction.*—The division of chemistry, under the direction of Prof. W. Mansfield Clark, continued its investigations of those chemical processes which involve the transfer of electric charges, which are known to be induced by living cells and which are classified as oxidation-reduction reactions.

It has previously been shown that certain organic compounds, when mixed in aqueous solution with their reduction products, induce characteristic differences of electrical potential between their solutions and a metal electrode, the potential being then determined by

the ratio of oxidant to reductant, by the hydron concentration of the solution, and by a constant characteristic of each set of compounds.

There has been accumulated a considerable body of exact quantitative data on reducible dyes, such as the much-used methylene blue, and on new compounds synthesized for this research. These data are being used to develop a series of indicators for the study of oxidation-reduction by the living cell, and for the clarification of the fundamental concepts of the biological problem. Incidentally, the results yield valuable data on dissociations and on the effects of substituting different groups in organic molecules. There also appear suggestions for methods of analysis, new interpretations of the practical uses of dyes in biochemistry, hints regarding the mechanism of reduction in the cell, and radical changes in points of view regarding such problems as anærobiosis.

The investigation has required extensive studies on the organic chemistry of certain dyes used in biochemical investigations.

There have now appeared in the Public Health Reports six papers under the general title "Studies on oxidation-reduction" and two others are in manuscript.

These studies, it is confidently hoped, are destined to throw new light on many problems of biology, physiology, sanitation, and other subjects of public-health importance.

*A specific test for cysteine.*—It is known that there is a dipeptide (glutathione) containing cysteine which is widely distributed in living tissue and which is concerned in oxidation-reduction processes. The isolation of this compound is extremely complicated, and the demonstration of its distribution has been dependent on a color test which is given also by uncombined cysteine. The division has worked out a test which is very specific for cysteine, and this is being applied to a further clarification of the distribution of organic sulphur compounds. Of particular interest is its application to the tissue of polyneuritic pigeons. It has been found that a deficiency of vitamine B in the diet results apparently in a deficiency of substances like glutathione which take part in the oxidation-reduction processes of the tissues.

*Isolation of a crystalline material having antineuritic properties.*—During the year the long-continued attempt to isolate in crystalline form an antineuritic vitamine culminated in the separation of a crystalline picrate which possesses antineuritic properties. This material is believed to be pure, but the remote possibility of inclusions will demand the preparation of a larger quantity and its careful study for characteristic chemical properties and for identification.

*New acid-base indicators.*—Following a previous report, the new indicator, brom cresol green, came into great demand, but was not being placed on the market because of manufacturing difficulties. Improvements in its preparation were made. The synthesis of intermediates for new indicators progressed.

*Analysis of arsenicals.*—The division of chemistry has charge of the chemical analysis of arsenicals licensed by the department. During the year 220 test samples were analyzed and gave evidence that the standards for arsenic contents are being complied with to a satisfactory extent.

*Method of analysis.*—The continued modification of arsenical drugs presents ever-new problems of analysis. Aside from a number of devices for handling individual cases of peculiar composition, a sys-

tematic study was begun on methods for estimating the chemical groupings of sulpharsphenamine and of neoarsphenamine, respectively, when these drugs are presented separately or in mixture.

A color test for arsephenamine sensitive to 5 parts in a million was noted.

*Proteolytic enzymes of bacteria.*—The liquefaction of gelatine is extensively used as a biochemical test in the identification of bacteria. The conditions controlling the production and activity of the proteolytic enzymes concerned are not only important for the proper use of the diagnostic test, but are also interesting because of possible relations to toxin production. A study of the problems involved has been begun and a rapid, practical method of obtaining an approximate measure of relative enzyme strength has been developed as a first step.

*Alum process for clarification of water.*—In cooperation with the office of stream pollution investigations the division is continuing its investigation of principles underlying the alum process widely used in the clarification of municipal water supplies. It has been demonstrated that the so-called "floc" formed when the alum solution is added to natural waters is a complex material, the composition of which is determined to a large extent by the hydron concentration and the anion content of the mixture. The solid can be treated as a solid solution in equilibrium with the liquid phase. These results explain qualitatively the existence of differences in the floc formation of different types of water. Intimately connected with the chemical composition of the waters and the floc are variations in the rate of the attainment of equilibrium conditions. These become evident in rate, volume, and general structure of floc formation. An empirical study of these relations has been begun.

All these studies are being made in the plan to reach general principles applicable to plant operation in a country exhibiting remarkable diversity in its water-supply problems.

*Miscellaneous.*—Assistance was given in the pellagra studies by the preparation of salt mixtures and vitamine concentrates for feeding experiments and by analyses of various foodstuffs.

Some 59 materials of widely varying nature were given detailed examination and 212 materials were subjected to analysis for special purposes.

A large number of standard solutions were prepared for other divisions of the Hygienic Laboratory or for other offices of the service.

A class of medical officers was given a course of instruction in chemical principles and in certain applications.

Members of the staff served on various committees, in consultation, and in preparation of memoranda.

#### DIVISION OF PHARMACOLOGY

Under the direction of Prof. Carl Voegtlin, the following activities have been undertaken by the division of pharmacology:

*Syphilis.*—The results of an investigation of the relative efficiency of arsphenamine, neoarsphenamine, and sulpharsphenamine suggest that the latter drug is somewhat more effective in the treatment of syphilis in rabbits than are the others. It was found by tests on syphilitic rabbits that the intramuscular administration of sulpharsphenamine is as effective as its subcutaneous or intravenous injection, a fact of considerable practical value. It was also shown that

treatment by mouth can bring about a complete healing of the syphilitic lesions, and if the treatment is continued for several weeks it prevents clinical relapse. The dose required for oral treatment, however, is considerably greater than that required for intramuscular, intravenous, or subcutaneous therapy.

Toward the end of the year an investigation was begun, in collaboration with the division of pathology and bacteriology, dealing with the significance of the Wassermann reaction and the so-called Sigma test in rabbit syphilis. The results so far obtained promise to throw considerable light on (1) the relative sensitiveness of the Wassermann test as compared with the Sigma test; (2) the relation between the stage of the disease and the appearance of positive tests; and (3) the usefulness of these tests for the evaluation of antisyphilitic drugs.

Some clinical reports on the value of sulpharsphenamine appear to indicate that this drug is quite effective in the treatment of syphilis and particularly of neurosyphilis. Sulpharsphenamine has also given very satisfactory results in the treatment of Vincent's angina.

The study of the mechanism of the action of arsenic upon protoplasm was continued with particular reference to (1) the antagonistic action of glutathione, a sulphur-containing compound occurring in protoplasm; (2) the penetration of various arsenicals into a large single-cell organism; and (3) the excretion of glutathione with human urine.

*Cancer.*—In view of the great importance of oxidation-reduction processes in the life of tissues, a comprehensive investigation has dealt with the comparison of the reducing power of cancer and normal tissues. In contradiction to some observations of other workers in this field, it was demonstrated beyond doubt that the reducing power of living cancer tissue is at least as great as that of normal tissues. A method for the estimation of reducing power of tissues was elaborated which has yielded results in complete harmony with observations made on the physicochemical side in the division of chemistry.

A large number of experiments were also carried out on the influence of various chemicals on the rate of tumor growth in the living animal. While some of the agents tried seemed to indicate some therapeutic action, the results so far have not been sufficiently definite to justify unquestionable conclusions.

*Insulin.*—Work was continued on this subject with particular reference to the biological standardization of this important drug. A new method in which the rat is utilized was devised for this purpose; this seems to be much more reliable than the older methods. It revealed considerable variations in the potency of commercial insulin and has also been used successfully for (1) the study of the antagonism of the active principles of glands with internal secretion (pituitary, adrenal, and pancreas), and (2) the study of some problems of intermediate metabolism.

*Pituitary.*—The standard pituitary powder prepared in this laboratory for purposes of standardization of this drug has been studied as to its action on urinary secretion and was supplied to a number of laboratories interested in the bio-assay and manufacture of pituitary extract. Some work was also done on the behavior of the active principle or principles of this powder when subjected to dialysis which has led to the conclusion that the various pharmacological actions of this drug are probably due to one and the same principle.

*Tuberculosis.*—The investigation of the nutritional requirements in this infection and the influence of diets deficient in vitamins on tubercle formation was continued. Thus far it has not been possible to influence the tuberculous process in laboratory animals by dietary means, but it has been observed that the infected animal requires a relatively larger supply of vitamin A to sustain a fair state of nutrition.

*Drug addiction.*—Further work on this subject has shown that monkeys can acquire a tolerance to morphine and that such animals show indications suggestive of "withdrawal symptoms" when the drug is discontinued. Experiments have also been started to determine whether or not monkeys can acquire a tolerance to codeine and cocaine, but no definite results have been obtained thus far. It was shown, furthermore, that human serum from drug addicts has no protective action against morphine in mice.

A narcotic survey was made in Allegany County, Md., to determine the amount of narcotics used for medicinal purposes during the period of one year. It is hoped that the results obtained will serve as a basis for estimating the medicinal needs of narcotics of the entire country.

*Permeability studies.*—Work was done on the effect of acids, in particular carbonic acid, on the permeability, the free electrolyte content, and the electrical conductivity of bacteria and red blood cells. These experiments are not completed, but in view of the peculiar rôle of carbonic acid as an important regulator of cellular permeability, and hence of cell metabolism, the studies seem to justify further effort.

*Cooperation with the revision committee of the United States Pharmacopœia.*—A member of the division continued during the year his cooperation, acting as chairman of the subcommittee on nomenclature. Assistance was also given to the committee on bio-assay.

Compilation of the comments on the United States Pharmacopœia and National Formulary for the calendar year 1921 was completed, and considerable work was done on the literature of 1922.

*Cooperation with the health committee of the League of Nations.*—The chief of the division attended a conference of pharmacologists and physiologists in Edinburgh, Scotland, in July, 1923. This conference, which was convened for the purpose of bringing about the adoption of international standards of certain important drugs, accepted as the international standard for pituitary extract the standard powder previously referred to in this report. It furthermore arranged for work in various centers for the study of the methods and standards used in the bio-assay of other drugs (insulin, digitalis, thyroid extract, etc.). As a result, the division has been engaged in the comparative assay of a digitalis leaf, which has been suggested by the conference as a possible standard.

It is believed that this sort of cooperation will be of mutual benefit to the various countries involved, as it will bring about greater accuracy and safety in the use of potent drugs.

*Miscellaneous activities.*—Routine examination were made of drug samples submitted by various offices of the Government and by persons outside the Government.

## VIRUSES, SERUMS, TOXINS, AND ANALOGOUS PRODUCTS

In connection with the enforcement of the law of July 1, 1902, governing the manufacture, importation, and sale of viruses, serums, toxins, and analogous products, inspections were made of American and European establishments holding or applying for licenses. It is essential that the preparations reach certain standards of purity and potency and that they be manufactured and labeled in conformity with regulations that have been prepared for this purpose by a board composed of the Surgeons General of the Army, Navy, and the Public Health Service. During the past year these regulations have been revised, and supplementary regulations were issued in regard to the control of the manufacture, importation, and sale of arsphenamine and its derivatives.

The routine work has consisted of the inspection of the plants of manufacturers with a view to determining their compliance with the standards which have been established as essential to the holding of licenses and the examinations of the products at the Hygienic Laboratory.

At the close of the fiscal year 38 domestic and 8 foreign establishments held licenses, an increase of 6 licensed establishments over the previous fiscal year—4 domestic and 2 foreign firms. No licenses were revoked or suspended during the year.

There are now 91 biological products licensed for interstate traffic.

The laboratory investigations relating to viruses, serums, toxins, and analogous products are reviewed on pages 55–56.

## MISCELLANEOUS

*Publications.*—All scientific papers and articles on health topics prepared by the personnel of the service for publication are submitted to this division for review and permission to publish. During the past year there were published 6 Hygienic Laboratory Bulletins, 5 Public Health Bulletins, and 7 additional bulletins are in press; 65 articles from the division were published in the Public Health Reports, and 12 from other divisions or by persons outside the service were reviewed before publication in the Public Health Reports. The personnel of the division published under their service designations 33 articles in outside journals; 31 articles by personnel of other divisions were reviewed in the division prior to publication in outside journals.

*Meetings.*—An important part of public-health work is the attendance by representatives of the service at meetings of scientific and sanitary associations and congresses. The arrangements for such attendance and for the presentation of papers are made in this division. The information gained by the officers through these details is of considerable importance, and the contacts there made with outside workers in similar lines are considered essential in connection with the study of public health problems. The program for the interchange of foreign health officials under the health section of the League of Nations, the third of its kind, was arranged in this division during the fall of 1923, when 25 visiting officials from 18 European and Latin American countries participated in the interchange in the United States and observed health departments and health activities in eight States.



## DIVISION OF DOMESTIC (INTERSTATE) QUARANTINE

In charge of Asst. Surg. Gen. W. F. DRAPER

The activities of this division during the past fiscal year to suppress epidemics and to prevent the interstate spread of disease have included (1) plague-suppressive measures, (2) activities for the eradication of trachoma, (3) the conduct of studies and demonstrations in rural sanitation, (4) the carrying out of service policies for the prevention of epidemics by assisting State health departments in establishing and improving local health service, (5) the improvement of sanitary conditions in the national parks, (6) the control of water supplies used for drinking and culinary purposes by interstate carriers, (7) supervision over sanitary and health conditions on interstate carriers, and (8) mosquito-control measures along the Texas-Mexican border to prevent the spread of yellow fever should it be introduced.

### PLAGUE-SUPPRESSIVE MEASURES

Operations for the control of plague in California have been continued, and a squirrel-free zone has been maintained between infected territory and the rat population of San Francisco, Oakland, and Berkeley. Rat-trapping measures were carried on in San Francisco.

The assistance rendered to local authorities in New England seaports in rat-trapping measures and in examining the rats caught has also been continued with satisfactory results.

#### PLAGUE-SUPPRESSIVE MEASURES, SAN FRANCISCO, CALIF.

Plague suppressive work has been continued in the four counties around San Francisco Bay. A zone is being maintained around the large centers of population as free from squirrels as possible. This is for the purpose of preventing plague-infected squirrels from coming in contact with rats in the cities and causing outbreaks of plague. Work is administered as follows:

- (a) Ground-squirrel control in the field.
- (b) Sanitary inspection in San Francisco.
- (c) Pathological and bacteriological examinations in the Federal laboratory.

*Ground-squirrel plague.*—In 1920 plague was found to be present in ground squirrels in 10 counties in California. Control measures have been carried out thus far in only four of these counties. The work has not been sufficiently thorough and extensive entirely to eradicate the infection, which is believed to still exist in most of the localities in which it has previously been found. In 1922 plague was found in the ground squirrels of two additional counties, Alameda and Santa Cruz. In 1923 plague was found in the ground squirrels in Contra Costa County.

In 1924 a new center of plague infection developed in San Luis Obispo County near San Luis Obispo City. The infection in this area is of a somewhat general and severe character and shows that the disease in ground squirrels is spreading and extending farther toward the southern part of the State.

A focus of infection also exists in the northern part of San Luis Obispo County, and squirrels in considerable numbers have been dying from this disease in the area near the boundary of Monterey County.

An unusual mortality in ground squirrels in San Benito County was reported in June, 1924, and is probably due to plague, although the investigations are not yet complete.

With such widespread prevalence of plague in ground squirrels there is constant danger that the disease may extend to rats in centers of population and give rise to more or less extensive outbreaks of plague in human beings. The State and local authorities have been thoroughly informed as to conditions, and the counties are cooperating with this service to a considerable extent in the plague-eradication work. State appropriations for this purpose, however, have been curtailed, and on the whole the plague-eradication work in California at the present time is not sufficient to prevent the disease from spreading and extending and threatening to cause epidemics which will necessitate expensive eradication measures in the future.

*Human plague.*—Each year one or two cases of human plague occur from contact with infected squirrels. This year one case of plague was contracted in Monterey County.

#### FIELD OPERATIONS FOR THE CONTROL OF GROUND SQUIRRELS.

The limited funds available for plague-eradication work have been used in the four counties in which the work has been carried on during the past two years. This work has demonstrated that it is practicable to control and eradicate squirrels in limited areas around cities and towns by coordinated and persistent efforts continued over at least a three-year period.

The activities have been handicapped to some extent by the outbreak of foot-and-mouth disease in two of the counties. On account of the quarantine restrictions imposed it was not possible to visit many of the ranches. Because of the very dry winter and spring the use of carbon bisulphide was curtailed, and this particular activity shows a slight falling off from that of the previous year.

The following statements shows the field operations:

Number of inspections.....	280
Number of reinspections.....	4, 539
Number of acres inspected.....	46, 992
Number of acres reinspected.....	1, 379, 576
Number of acres treated with waste balls.....	38, 961
Number of acres treated with grain.....	278, 324½
Number of holes treated with carbon bisulphide.....	327, 915

#### *Material used*

Number of pounds poisoned grain.....	163, 650
Number of gallons carbon bisulphide.....	5, 186½
Number of waste balls used.....	327, 915

*Poisoned barley mixed for private landowners under supervision of employees of service*

Number of pounds..... 96, 015

*Experimental work with calcium cyanide*

Acres of land treated..... 53  
 Number of squirrel burrows treated..... 800  
 Pounds calcium cyanide used..... 50

*Work performed in conjunction with horticultural commissioners in Contra Costa County*

Inspections made..... 85  
 Permits issued..... 85

SANITARY INSPECTIONS IN SAN FRANCISCO

The sanitary inspections performed in the city of San Francisco are on complaints referred from the city health department and from other sources.

The work accomplished is as follows:

Rat complaints.....	924
Manure and stable complaints.....	63
Chicken, rabbit, pigeon, etc., complaints.....	292
Garbage and defective garbage cans.....	198
Rubbish complaints.....	113
Plumbing complaints.....	2
Insanitary premises, including shacks.....	385
Stench complaints.....	79
Goat, dog, and cat complaints.....	32
Mosquito, fly, and flea complaints.....	22
Swine complaints.....	4
Plumbing complaints, referred to board of health.....	8
Lots from which stagnant water has been pumped.....	19
Miscellaneous.....	204

NOTE.—All the above complaints were investigated by the inspectors, the necessary notices prepared and sent out, and reinspections made to determine whether the existing nuisances were abated.

MEASURES TAKEN AGAINST RATS

During the year a rat survey has been carried out in San Francisco, under the direction of this office, at the request of the city health officer. Two employees were appointed by the Public Health Service for trapping operations along the water front. Later the health department secured an appropriation of \$5,000 for this purpose, and four additional trappers were placed on duty in November, 1923, and were continued through the remainder of the fiscal year.

Sixteen thousand eight hundred and eighty-three city rats were examined in the laboratory of this station and none was found to be infected with plague. In addition, 485,200 pieces of poison were placed in vacant lots, lumber piles, etc.

The rats were of the following species: *Mus norvegicus*, 12,468; *Mus rattus*, 1,852; and *Mus alexandrinus*, 2,563.

Other measures against rats were:

Number of premises inspected.....	16, 221
Number of nuisances abated.....	3, 172
Number of complaints investigated.....	2, 345
Number of garbage cans installed.....	1, 535
Number of chicken yards abandoned.....	204

Number of chickens, pigeons, rabbits, etc., disposed of.....	3, 022
Number of vacant lots cleaned.....	22
Number of basements cleaned.....	156
Number of yards cleaned.....	182
Number of premises cleaned of rubbish.....	87
Number of floors torn up.....	282
Number of basements torn up.....	60
Number of yards torn up.....	44
Number of buildings destroyed.....	152
Number of stables destroyed.....	35

*Measures taken for the permanent rat proofing of old buildings, including food places*

Number of buildings rat proofed by concreting.....	417
Basements concreted (97,190 square feet).....	62
Floors concreted (583,065 square feet).....	379
Yards, passageways, sidewalks, etc., concreted (35,440 square feet).....	30
Total area concrete laid.....square feet..	715, 695
Number of area walls installed (64,948 cubic feet).....	162
Number of floors rat proofed with double floors and wire cloth between (74,090 square feet).....	42
Lens lights replaced.....	8, 030
Openings in walls, ceilings and floors, and around pipes closed by wire cloth and cement.....	8, 959

*Condemnation proceedings*

Number of buildings submitted to board of health for condemnation....	181
Number of buildings acted on by board of health and condemned.....	123
Number of buildings acted on by board of health and not condemned..	54
Number of buildings <sup>1</sup> abated following condemnation proceedings: By repair, 23; by demolition, 98.....	121
Number of buildings condemned and remaining unabated.....	79

OPERATIONS OF FEDERAL LABORATORY

The policy of previous years has been continued in the operation of the laboratory. Work has also been done for the hospital and relief stations of the service on the Pacific coast, for the certification of water on interstate carriers, and for the Veterans' Bureau, the Indian Medical Service, and the National Park Service.

Work has been done to determine the possibility of the spread of chlonorchiasis on the Pacific slope.

Investigations were made at Pacific coast ports of the methods of examination of aliens for the detection of intestinal parasites. Studies were carried out in the laboratory, and recommendations were made with a view to standardizing the technique of conducting these examinations.

A case of human plague in San Francisco county was investigated and proven.

*Summary of laboratory work.*—Laboratory work in connection with field operations.

Examination of rodents for plague:

Rats from San Francisco and other localities.....	17, 003
Rats from fumigated ships.....	2, 575
Ground squirrels.....	148

Total.....	19, 726
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<sup>1</sup> These include some buildings condemned during previous years; hence totals will not balance.

Serological examinations:	
Wassermann reactions .....	2, 435
Widal tests .....	26
Total .....	2, 461
Bacteriological examinations (culture and microscopic):	
Blood .....	40
Feces (for typhoid) .....	29
Urine (for typhoid) .....	19
Sputum .....	1
Other fluids .....	10
Catgut .....	29
Water examinations .....	20
Total .....	148
Bacteriological examinations with animal inoculation:	
Tuberculosis .....	27
Plague squirrels .....	36
Human plague .....	1
Total .....	37
Parasitological examinations:	
Human feces .....	26
Histological examinations .....	
Miscellaneous .....	75
Autogenous vaccines .....	5
Autogenous vaccines .....	3
Total examinations and analyses .....	22, 508

#### PLAGUE SUPPRESSIVE MEASURES AT SEATTLE, WASHINGTON

Plague preventive measures on the Puget Sound were continued as heretofore.

<i>Rat proofing</i>		Number
New buildings inspected .....		604
New buildings reinspected .....		957
Basements concreted, new buildings (square feet) .....	309, 670	495
Floors concreted, new buildings (square feet) .....	193, 495	85
Yards, etc., concreted (square feet) .....	38, 260	46
Sidewalks concreted (square feet) .....	306, 497	
Total concrete laid, new buildings (square feet) .....	847, 922	
New buildings elevated .....		14
New premises rat proofed, concrete .....		580
Old buildings inspected .....		36
Premises rat proofed, concrete, old buildings .....		36
Wooden floors removed, old buildings .....		36
Floors concreted, old buildings .....		36
Buildings razed .....		10
<i>Water front</i>		
Vessels inspected, for fending and rat guarding .....		597
Vessels fumigated .....		178
New rat guards installed .....		113
Defective rat guards repaired .....		223
Port sanitary statements issued .....		3, 208
Sulphur used .....	pounds ..	155, 100
Cyanide used .....	do ..	12, 882
Muriatic acid used .....	pints ..	53, 260

The usual patrol was maintained to enforce rat guarding and fending on all vessels arriving from plague-infected ports.

*Laboratory operations*

Dead rats received.....	19
Rats trapped and killed.....	18, 941
Rats after fumigation.....	1, 942
Total rats.....	20, 902
Rats examined for plague infection.....	14, 414
Rats proved plague infected.....	0
Blocks poisoned.....	63
Sanitary fills poisoned.....	14
Poison disbursed, pounds.....	408

*Classification of rodents*

Mus rattus.....	1, 510
Mus Alexandrinus.....	3, 101
Mus musculus.....	2, 512
Mus norvegicus.....	13, 779
Average number of traps in use daily.....	590

All traps were inspected daily

ASSISTANCE TO LOCAL AUTHORITIES OF NORTH ATLANTIC SEACOAST  
CITIES IN TRAPPING AND EXAMINING RODENTS.

These activities have been continued as outlined in the annual report for 1923. The work has involved the trapping of live rodents, the collection of fleas from them, the identification of the species by microscopic examination, and the examinations of the rodents for plague lesions.

The rodent flea survey work at Boston, Mass., was discontinued in November, 1923. An average of about 50 rodents per week was delivered to the bacteriologist for examination. No plague suspicious lesions were found.

The rodent flea survey conducted by the New York City Health Department continued throughout the year. The fleas secured were shipped to Surgeon Carroll Fox, of the Public Health Service, for identification. Assistance was also given to the New York City Health Department in trapping and examining rodents for lesions suspicious of plague. About 3,300 live rats were trapped, from which about 6,000 fleas were obtained. In addition, about 15,000 other rodents were trapped and examined for plague suspicious lesions.

TRACHOMA ERADICATION WORK

*Historical.*—Trachoma prevention work was commenced with a survey in eastern Kentucky in 1912. An intensive survey of Knott County, Ky., at that time showed a deplorable condition. Out of 4,000 examined in that and surrounding counties, 500, or 12½ per cent, were suffering from trachoma. A large number of these were school children. The disease was so prevalent and of such long standing that the inhabitants seemed to consider it a matter of course. One old resident expressed it, "You can't throw a stone in any direction without hitting sore eyes." In the report made of this investigation, in 1912, it was stated:

Many were blind from trachoma, after suffering practically all their lives; many remained in dark rooms, shielding their eyes, who had probably not seen

light for weeks or months. These cases had existed for a period of years, and not a few for 40 years or even longer. There was the acute beginning in childhood, all the way through the various ages and stages, to those old cases which had handicapped their victims for a lifetime and ended in blindness. There were many pathetic cases among those blind people who live in the mountains, far from medical centers. There is no lack of evidence that trachoma is both communicable and dangerous to sight. The disease not only lasts throughout a lifetime of an individual, but constantly claims other victims, and gains strength as it goes along; a fearful handicap with which to struggle through life, only to pass their final days in darkness, a burden to themselves, their families, and friends. By patience and unflagging perseverance this scourge can be removed, and these people given the opportunity which has heretofore been denied them, by reason of this ever-present handicap—trachoma.

The first service trachoma hospital was established in Hindman, Knott County, Ky., in September, 1913, and remained there for three years. In that time the scourge had been practically eradicated from probably the worst infected county in the United States. In order to determine the final result of the trachoma campaign, the officer who made the original survey returned to Knott County in August, 1923. The changes observed were most remarkable and satisfactory. In place of the many sore-eyed people and almost universal practice of wearing colored glasses, as was the case 10 years previous, there was seen scarcely a single colored glass and practically no active trachoma. From the standpoint of public health, humanity, and economic considerations, there is no way of estimating what this relief has been worth, not only to the county and State, but to the entire United States. Many of the former trachoma cases had gone to other States, many were serving in the Army, but all had been relieved of their trachoma—a communicable eye disease—before leaving their homes. At the commencement of this work numbers of people blind from trachoma were paupers and county charges. It was gratifying to find that some of these had been removed from the list and that new ones had not been added. The records show that 740 trachoma patients, residents of Knott County, were treated at the service trachoma hospitals at Hindman and Pikeville during the years 1913 to 1922, inclusive. It was, of course, impossible to see personally all of these cases. Arrangements, however, were made for meeting and examining a large number, and the county health officer, a competent man acquainted with almost every person in the county, was able to give correct information of many more. It was ascertained, after carefully considering each case, that out of the 740 there were only 12 cases known to be suffering from active trachoma; 469, or 63 per cent, were known to be completely cured of trachoma; the results of 259, or 35 per cent, were in doubt. It is therefore not known positively how many of the 259 were still suffering from trachoma, but if the same ratio of cures has prevailed, there would still be about 7 active cases, or only 19 trachoma cases remaining uncured out of the 740.

In summary, it can be stated that one of the worst infected trachoma regions has been practically cleared of the disease, and that the prophecy made in the original report of the survey—"by patience and unflagging perseverance, this scourge can be removed and these people given the opportunity which has been denied them by this ever-present handicap, trachoma"—has been fulfilled.

At the close of the fiscal year 1924 four trachoma hospitals were in operation, as follows: Knoxville, Tenn.; Pikeville, Ky.; Rolla, Mo.; Russellville, Ark.

A fifth hospital, established April 19, 1923, at Pelham, Mitchell County, Ga., was closed on August 14, 1923. The trachoma hospitals formerly located at Greenville, Ky., and LaMoure, N. Dak., closed in accordance with service policy, will be relocated as soon as suitable location can be found. It is probable that the Dakota hospital will be located in St. Louis County, Minn., at an early date. The Tennessee hospital, formerly located at Morristown, has been moved to Knoxville, Tenn., and is being conducted in close cooperation with the city health authorities. On July 24, 1923, a trachoma hospital was located at Rolla, Mo., with a bed capacity of 24.

There has been some reduction in the number of hospital cases treated during the past fiscal year as compared with the previous year. This has been due to the fact that two of the trachoma hospitals were closed, pending new locations.

The service trachoma hospitals have been conducted with reduction in the total cost as compared with the previous year. The per diem cost of each hospital patient has been \$2.96. In computing this, the expense of the central office in Louisville, Ky., has not been included. This would increase the per diem by about \$0.85. It should be stated, however, that the doctors and nurses who conduct the trachoma hospitals also do all of the dispensary work and conduct the field clinics, but no deduction has been made from the hospital per diem of \$2.96 on this account. Should this be done, it would very materially decrease the hospital per diem, since, as the tables show, the field activities have constituted a large part of the trachoma-prevention work. Patients have been retained in the hospitals on an average of 21.8 days. The cures effected during the past fiscal year were somewhat increased over the previous year. This number of cures refers only to hospital cases and only to those cases which have been reexamined and, after discharge from the hospital, found to be cured. It is impossible to see very many of these cases once they are discharged from the hospital for home treatment, and, it is therefore impossible to determine with any degree of accuracy the total number that have been cured.

The trachoma hospitals were utilized as bases for field work more than in previous years. Fifty-one field clinics were held as compared with 33 in the previous year. A total of 9,910 persons were examined at these clinics as compared with 7,602 in the previous year. Of the 9,910 persons examined, 1,701 had trachoma and were treated. Eight hundred and thirty-five operations were performed, compared with 355 in the previous year. At these clinics the ordinary trachoma cases were operated upon and treated, while the more severe cases, or those which would probably give considerable reaction, were sent to the hospital, where longer postoperative treatment could be given. These field clinics have been conducted principally in Missouri, in cooperation with the State board of health. Doctors and nurses are sent out in advance by the State board of health to those counties known to be infected with trachoma. They make arrangements for temporary hospital accommodations at a convenient location in the county. The local churches are asked to cooperate by furnishing meals free of charge to patients who have



to remain in the temporary hospital. The clinic is advertised for two or three weeks in advance, and the doctors and nurses then make a survey of the county, through the schools and other institutions, for the purpose of ascertaining where the trachoma cases are and arousing sufficient interest to insure their attendance.

For the most part these clinics have been on the railroad lines, and the railroad companies have extended valuable cooperation. Each railroad company has furnished a private car (with one attendant, a cook), which is hauled from place to place without charge, but all passengers on the car are required to pay the regular fare. The subsistence has been furnished by the State board of health. All of the hospital equipment, also furnished by the State, is placed upon this car, and upon arrival at the place designated for the clinic, it is promptly transported to the temporary hospital and placed in position. Eye examinations are made on the observation end of the car, and the diagnosis and treatment are determined. The patients then pass on through the car and are taken in charge by an attendant. In this manner it is possible to conduct clinics at two or three different points in a week, because the hospital equipment can very promptly be loaded on to the car at the completion of a clinic and the car picked up by the next local train and placed in position for the succeeding clinic. At any one hospital of comparatively few beds, only a limited number of patients can be handled in a year, but with the clinics operating as above described many hundreds of persons can be treated and only selected cases need be sent to the hospital. The clinics as conducted in Missouri in cooperation with the State board of health have proved of very great value. Trachoma work has been carried on in cooperation with the State boards of health of 12 States during the fiscal year.

The patients treated at the field clinics are left in charge of the county nurse or nurses for after treatment, and it is quite impossible to say definitely how many cures have actually been effected. In a general way, however, from reports received from the local doctors and nurses, in many instances, the results of these clinics are extremely satisfactory, many of the cases having been cured by operation and postoperative medical treatment, and others (the more chronic and persistent) have been very materially benefited, and the length of time to cure has been considerably reduced. The field clinics and surveys have been conducted in Arkansas, Indiana, Kentucky, Minnesota, Missouri, and Ohio, in cooperation with the boards of health of those States.

During April, 1924, in company with the Secretary of the Interior and the Commissioner of Indian Affairs, the officer in charge of trachoma-prevention work visited Indian schools and reservations in Arizona and New Mexico for the purpose of learning at first hand the amount of trachoma existing among the Indian population. This visit was undertaken at the request of the Secretary of the Interior for the purpose of formulating a program for the eradication of trachoma among the Indians. A sum of about \$100,000 has been appropriated by Congress for this purpose, effective July 1, 1924. The program prepared has been approved by the Commissioner of Indian Affairs and it is understood that the work will begin soon after July 1. Trachoma is extremely prevalent among the Indians and constitutes an important public health problem.

A laboratory has recently been established at Rolla, Mo., in connection with the service trachoma hospital at that place.

The following are tables showing dispensary and hospital relief, educational work (house-to-house visits), and field clinics.

*Dispensary and hospital relief, operations, etc.*

	Morristown and Knox- ville, Tenn. <sup>1</sup>	Pelham, Ga. <sup>2</sup>	Pike- ville, Ky.	Rolla, Mo. <sup>3</sup>	Russell- ville, Ark.	Total
<b>Dispensary relief:</b>						
Old cases all causes.....	1, 576	151	759	640	908	4, 034
Old cases trachoma.....	1, 336	103	537	576	634	3, 186
New cases all causes.....	650	180	706	457	756	2, 779
New cases trachoma.....	237	16	134	215	127	729
Total attendance.....	2, 256	331	1, 465	1, 097	1, 664	6, 813
Total number of treatments.....	2, 271	331	1, 492	1, 408	1, 667	7, 169
Average daily attendance.....	6. 6	7. 4	4. 08	4. 1	4. 6	-----
Impaired vision from trachoma.....	126	0	115	181	104	526
Corneal opacity from trachoma.....	20	1	38	111	66	236
Blindness both eyes from trachoma.....	1	0	1	0	2	4
Blindness one eye from trachoma.....	2	0	4	0	1	7
Ulcer from trachoma.....	9	0	29	82	9	129
Pannus from trachoma.....	15	0	78	148	65	306
Entropion from trachoma.....	21	0	13	61	37	132
Trichiasis from trachoma.....	1	0	9	37	43	90
Photophobia from trachoma.....	102	4	96	175	77	454
Conjunctivitis.....	263	81	308	156	231	1, 039
Glaucoma.....	1	0	1	0	2	4
Trachoma cases cured.....	23	37	4	49	77	190
<b>Hospital relief:</b>						
Remaining from previous year.....	8	16	11	0	8	43
Admitted during year.....	224	23	165	183	147	742
Discharge during year.....	212	39	166	160	147	724
Remaining at close of year.....	20	0	10	23	8	61
Days relief furnished.....	4, 041	465	3, 299	6, 685	2, 658	17, 148
Rations furnished.....	5, 704	636	4, 992	8, 584	4, 334	24, 250
Cost of rations.....	\$2, 002. 80	\$236. 30	\$2, 438. 58	\$3, 541. 50	\$1, 845. 60	\$10, 064. 78
<b>Operations:</b>						
General anesthesia.....	4	1	15	19	0	39
Local anesthesia.....	216	14	118	139	130	617
Grattage.....	202	13	115	154	67	531
Entropion.....	9	0	10	23	56	98

<sup>1</sup> Transferred from Morristown to Knoxville, Tenn. Closed Aug. 31, 1923, reopened Sept. 24, 1923.

<sup>2</sup> Closed Aug. 14, 1923.

<sup>3</sup> Opened July 24, 1923.

<sup>4</sup> Hospital cases which have been reexamined and found cured. Impossible to determine with any degree of accuracy total number cured, as it is difficult to see and examine many of them once they are discharged from hospital for home treatment.

*Educational work, house-to-house visits, etc.*

	Morristown and Knox- ville, Tenn.	Pelham, Ga.	Pike- ville, Ky.	Rolla, Mo.	Russell- ville, Ark.	Total
Public talks given.....	0	0	0	2	66	68
People (estimated) in audience.....	0	0	0	150	2, 349	2, 499
Pamphlets on trachoma issued.....	77	0	34	210	249	570
House-to-house visits.....	15	0	0	20	10	45
People in houses visited.....	77	0	0	42	50	169
Trachoma cases in houses visited.....	14	0	0	6	5	25
Schools visited.....	31	0	0	8	21	60
Pupils examined in schools.....	4, 493	0	0	604	3, 294	8, 391
Trachoma cases in schools.....	121	0	0	19	6	146

*Field clinics*

Number of clinics held.....	51
Number of persons examined, all ages.....	9, 910
Trachoma cases found.....	1, 701
Suspicious cases found.....	188
Operations performed.....	835
General anesthetic.....	111
Local anesthetic.....	724
Local people assisting.....	2, 256
Physicians present.....	376

### ACTIVITIES RECOMMENDED BY THE ADVISORY COMMITTEE ON THE EDUCATION OF SANITARIANS AND THE FUTURE OF PUBLIC HEALTH IN THE UNITED STATES

Upon the recommendation and with the aid of the advisory committee on the education of sanitarians and the future of public health in the United States, the Public Health Service has continued its activities in this field.

A meeting of the committee was held August 15, 1923, and considerable business has been done with the committee through correspondence.

*Public-health summer schools.*—Following the August meeting of the committee, held to consider the response of physicians and sanitarians to the proposal that one or more public-health institutes be established, negotiations were entered into with several universities, with the result that four, by June 30, 1924, had completed plans to conduct public-health summer schools—the University of Iowa, the University of California, the University of Michigan, and Columbia University. Three of these public-health summer schools opened during the present fiscal year, the one at Iowa on June 9 and those at the University of Michigan and the University of California on June 23. The Columbia University Public Health Summer School was to have opened July 7.

In January information concerning the public-health summer schools was sent out to physicians and sanitarians throughout the United States together with a blank reply post card affording the recipients an opportunity to make further inquiries. Approximately 6,000 of these cards were received, and they were forwarded to the universities, which supplied the desired information.

An illustrated publication entitled "The public-health summer school as an opportunity for a profitable vacation" was prepared and it was hoped that this announcement might be published in the numbers needed by the service. Due to a legal restriction, this was not possible. The International Health Board, however, made it possible for the National Health Council to print and distribute this publication, and it went forward, together with a letter from the National Health Council and one or two of the separate announcements of the public-health summer schools, to approximately 108,000 physicians and sanitarians.

The service itself circularized the same number of physicians and sanitarians with a letter, together with multigraphed memoranda regarding the summer school.

One thousand copies of a final general announcement of the public-health summer schools were issued. Copies have been sent to presidents of universities, deans of medical schools affiliated thereto, deans of summer schools of various universities, also to State and city health officers, and to others especially interested.

*The recruiting of new personnel.*—In the early part of the year considerable work was done with the aid of members of the committee in bringing into final form the pamphlet, "Opportunities for a life career in the field of public health."

During the spring of 1923 several lectures were given to audiences of university students on "The field of public health as a life career," as follows:

Date	City	Institution	Attendance
1923			
Mar. 20.....	Boston, Mass.....	Tufts Medical School.....	500
Mar. 26.....	New York City.....	Columbia University.....	100
Apr. 16-17.....	Ithaca, N. Y.....	Cornell University.....	150
			150
			250
			150
			125
			200
Apr. 18.....	Rochester, N. Y.....	University of Rochester.....	1,025
Do.....	Syracuse, N. Y.....	Syracuse University, College of Medicine.....	200
Apr. 19.....	Hamilton, N. Y.....	Colgate University.....	450
Apr. 26.....	Northampton, Mass.....	Smith College.....	800
Total attendance.....			3,275

*The training of sanitarians for the future.*—A report has been prepared showing that graduate degrees in public health have been issued by the universities of the United States for the year ending July 1, 1924, as follows:

*Number of persons receiving graduate degrees in public health subjects from 12 institutions in the year ended July 1, 1924*

	D. P. H., Gr. P. H.	Ph. D.	D. Sc.	M. P. H., M. S., M. A.	C. P. H., Cert. San.	Total
Johns Hopkins University School of Hygiene and Public Health.....	14		9		13	36
Harvard University School of Public Health.....	5			4		9
Massachusetts Institute of Technology.....	1	2				3
University of Pennsylvania School of Hygiene and Public Health.....						0
Yale University.....		2		2	1	5
University of California.....				1		1
New York University (University and Bellevue Hospital Medical College).....					8	8
University of Michigan.....	1			3		4
University of Minnesota.....				1		1
Howard University.....						0
Detroit College of Medicine and Surgery.....	1					1
Ohio State University.....						0
Total.....	22	4	9	11	22	68
Total, 1923.....	18	6	21	3	28	76
Total, 1922.....	14	5	6	3	39	67
Total, 1921.....	22	4	1	5	66	98
Total, 1920.....	8	1	1	3	84	97

*The training of sanitarians now employed.*—In addition to the work done by the Public Health Service in encouraging the establishment of public-health summer schools, a study was made to determine the extent to which correspondence courses in public health are offered by the universities of the country. The study indicated that courses have been conducted during the past two years by seven State departments of health and by six universities.

Of the courses for sanitarians conducted by the State departments of health, those offered by the Ohio and Kansas departments appear to have been fairly successful. In Ohio since January, 1922, 34 persons have apparently done creditable work and have completed the course. In Kansas 105 completed a course of 40 lessons; however, only 13 are now enrolled. The New Mexico course was taken by 50 persons, but no examination was required.

Of the courses for sanitarians offered by universities those conducted by the University of Chicago appear to be most satisfactory; at this institution 124 students have completed one or more courses since 1899. The University of Missouri offers only one course, but since 1914 157 have completed it. Creditable work apparently is done at the University of Wisconsin, but definite information regarding the number of students has not yet been received. The course for health officers at New York University appears to have been successful, but it is reaching a rapidly decreasing number of students, 7 only having completed the course and received the certificate in 1924, while in 1920 there were 62. A correspondence course for public health nurses at New York University apparently remains popular; 152 nurses were taking this work in June, 1924.

*The task of providing vocational opportunities under favorable tenure and adequate compensation.*—Work on the books for mayors and governors has been finished, and a manuscript copy has been mailed to approximately 500 mayors. Later a bound edition of the book be published.

#### SUPERVISION OF COMMON CARRIERS' WATER SUPPLIES

Supervision of water supplies used for drinking and culinary purposes by common carriers engaged in interstate traffic has been carried on in cooperation with the State health departments, as in the past. In States maintaining efficient and adequate health organizations this work was done by the personnel of the State. Where sanitary-engineering divisions or bureaus did not exist the Public Health Service assisted. Work of this character results in a marked decrease in water-borne diseases through the improvement of municipal and privately owned water supplies. The general decrease in the death rate from typhoid fever may be attributed in part to the constantly improving drinking-water supplies.

Four States—Maine, Colorado, Nebraska, and Nevada—were given considerable assistance in the investigation and improvement of their water supplies, while two others—Utah and Wyoming—were aided to a less extent. During the year Colorado, Delaware, and North Dakota employed engineers to assist the respective State health departments, but North Dakota continued this arrangement for only a short period.

No radical changes have been made in the procedure for certification adopted by the Conference of State and Territorial Health Officers in 1919 and modified in 1921. Efforts are being directed toward simplifying the work. The chief object of the certification of water sources for common carriers is the permanent improvement of those supplies, with a decrease in water-borne diseases.

#### INTERSTATE RAILROAD WATER SUPPLIES

In the past all railroad companies have been required to forward annually to the Public Health Service and to the State health departments concerned two lists of sources of water to be used for drinking and culinary purposes. As very few changes in sources took place during a six-month period, a change in the interstate quarantine regulations was made, eliminating the list previously transmitted each July. This will result in a more nearly complete and correct list each year and will tend to greater efficiency in carrying out the investigations of sources.

Further reductions in the work are contemplated and will be carried out before the beginning of the next calendar year in those States where control results in the past warrant reductions.

The installation on common carriers of water coolers in which water and ice do not come in contact has progressed rapidly. A report from the railroads on November 16, 1922, indicated that about 40 per cent of the equipment had separate compartment coolers. In September, 1923, this figure had increased to about 50 per cent, and since that date greatly increased activity on the part of the railroads has taken place. The time limit for the completion of this work has been extended from July 1, 1924, to January 1, 1925, at the request of the American Railway Association.

In rendering assistance to the railroads on the water-cooler problem it has been necessary to review carefully 450 blue prints showing cooler designs and to make suggestions as to improvements in each case. This has enabled the railroads to secure coolers which are as satisfactory as can be devised at present.

The American Railway Association and the cooler and car building companies have continued their cooperation.

The following table sets forth the number of sources of supply certified during the last fiscal year. Since the water supplies of all large cities have been approved and since the greatest travel takes place to and from those cities, the percentage of travelers safeguarded from impure water is considerably larger than the percentage of supplies certified.

*Railroad supplies*

State	Source				Certified			Action pend- ing	Per cent sources certi- fied
	Pub- lic <sup>1</sup>	Pri- vate <sup>2</sup>	Rail- road	Total	Satis- factory	Pol- luted	Provi- sional		
Alabama.....	30	8	7	45	42	2	0	1	98
Arizona.....	7	9	12	28	8	0	0	20	29
Arkansas.....	33	19	22	74	8	2	4	60	19
California.....	43	17	28	88	52	0	0	36	59
Colorado.....	32	4	10	46	26	1	0	19	59
Connecticut.....	29	0	0	29	18	0	11	0	100
Delaware.....	6	0	1	7	6	0	1	0	100
District of Columbia.....	1	0	0	1	1	0	0	0	100
Florida.....	44	7	8	59	34	0	0	25	58
Georgia.....	63	2	3	68	63	1	0	4	94
Idaho.....	20	3	15	38	14	0	0	24	37
Illinois.....	66	13	24	103	71	6	22	4	96
Indiana.....	50	0	15	65	49	0	1	15	77
Iowa.....	58	1	20	79	62	1	1	15	81
Kansas.....	81	2	13	96	80	1	0	15	84
Kentucky.....	24	12	12	48	26	2	0	20	58
Louisiana.....	31	13	12	56	35	8	0	13	77
Maine.....	35	2	6	43	34	2	0	7	84
Maryland.....	13	1	7	21	14	3	0	4	81
Massachusetts.....	40	0	1	41	41	0	0	0	100
Michigan.....	66	12	28	106	99	1	0	6	94
Minnesota.....	48	4	33	85	66	6	0	13	85
Mississippi.....	31	10	10	51	26	1	0	24	53
Missouri.....	56	10	23	89	1	0	0	88	1
Montana.....	20	5	6	31	29	0	0	2	94
Nebraska.....	37	0	22	59	52	0	0	7	88
Nevada.....	9	1	9	19	15	1	0	3	84
New Hampshire.....	18	0	1	19	18	1	0	0	100
New Jersey.....	40	4	2	46	45	1	0	0	100
New Mexico.....	11	2	10	23	21	0	0	2	91
New York.....	102	16	18	136	59	6	0	71	48
North Carolina.....	43	12	6	61	44	2	0	15	75
North Dakota.....	14	3	32	49	0	0	1	48	2
Ohio.....	79	5	17	101	87	2	0	12	88
Oklahoma.....	47	2	18	67	14	1	0	52	22
Oregon.....	39	4	10	53	25	1	0	27	49
Pennsylvania.....	130	16	16	162	80	3	0	79	51
Rhode Island.....	2	0	2	4	3	1	0	0	100
South Carolina.....	32	5	1	38	31	0	0	7	82
South Dakota.....	18	2	10	30	9	3	0	18	40
Tennessee.....	28	9	10	47	20	2	0	25	47
Texas.....	97	17	52	166	89	1	16	60	64
Utah.....	14	4	8	26	17	2	0	7	73
Vermont.....	15	6	0	21	21	0	0	0	100
Virginia.....	45	6	9	60	54	1	0	5	92
Washington.....	38	4	19	61	34	2	0	25	59
West Virginia.....	27	15	6	48	34	3	0	11	77
Wisconsin.....	45	15	17	77	23	1	0	53	31
Wyoming.....	14	0	5	19	12	2	0	5	74
Total.....	1,871	302	616	2,789	1,712	73	57	947	66.0

<sup>1</sup> The column headed "Public" includes supplies owned by municipalities as well as those used by municipalities but owned by private companies.

<sup>2</sup> A "Private" supply refers to a small well or spring supply used only by the carrier and the person owning it.

## INTERSTATE VESSEL WATER SUPPLIES

The supervision of vessel water-supply systems and of the drinking and culinary water used on board vessels has improved and progressed during the year. The work is handicapped by lack of sufficient personnel to conduct it as effectively as is desired.

The State departments of health have cooperated as fully as possible in making investigations ashore of the sources of water supplies used by vessels, and city health departments are also working in cooperation with the district engineers of the Public Health Service and make laboratory examinations of samples of water taken directly from the vessels. This cooperation has been of great value to the

district engineers because it affords a check on the water systems in operation on the vessels.

General sanitary conditions on board ship have been greatly improved through the inspections of this service. Especial assistance has been given to vessels of the United States Shipping Board.

Through the cooperation of shipbuilding companies and naval architects a complete and comprehensive circular on sanitary water-supply systems for vessels has been prepared. Promulgation of this circular will be requested in the near future.

The following table summarizes, by States, data pertaining to the certification of vessel water supplies ashore. The low percentage of sources reported is due to lack of investigation of many small and remote sources.

*Vessel certificates*

State	Source				Certified			Action pending	Per cent sources certified
	Public <sup>1</sup>	Private <sup>2</sup>	Company	Total	Satisfactory	Pol-luted	Provi-sional		
Alabama.....	4	0	0	4	4	0	0	0	100
Arkansas.....	3	0	0	3	0	0	0	3	0
California.....	22	6	2	30	0	0	0	30	0
Connecticut.....	6	1	0	7	6	0	0	1	86
Delaware.....	1	0	0	1	1	0	0	0	100
District of Columbia.....	1	0	0	1	1	0	0	0	100
Florida.....	17	6	2	25	3	0	0	22	12
Georgia.....	3	0	0	3	2	0	0	1	67
Illinois.....	6	1	0	7	5	0	1	1	86
Indiana.....	4	0	0	4	4	0	0	0	100
Iowa.....	1	0	0	1	1	0	0	0	100
Kentucky.....	6	1	0	7	6	0	0	1	86
Louisiana.....	6	2	3	11	3	0	0	8	27
Maine.....	8	0	0	8	8	0	0	0	100
Maryland.....	2	1	1	4	2	0	0	2	50
Massachusetts.....	10	0	0	10	10	0	0	0	100
Michigan.....	10	1	0	11	11	0	0	0	100
Minnesota.....	2	0	0	2	0	0	0	2	0
Mississippi.....	4	1	1	6	3	0	0	3	50
Missouri.....	1	1	0	2	0	0	0	2	0
New Jersey.....	14	0	2	16	15	0	0	1	94
New York.....	14	1	0	15	9	0	0	6	60
North Carolina.....	5	2	1	8	5	0	0	3	63
Ohio.....	11	0	0	11	8	0	0	3	73
Oregon.....	16	1	0	17	0	0	0	17	0
Pennsylvania.....	10	2	1	13	4	0	0	9	31
Rhode Island.....	3	1	0	4	4	0	0	0	100
South Carolina.....	4	2	1	7	3	0	0	4	43
Tennessee.....	4	3	0	7	0	0	0	7	0
Texas.....	7	5	0	12	0	0	0	12	0
Vermont.....	1	0	0	1	1	0	0	0	100
Virginia.....	9	2	1	12	9	0	0	3	75
Washington.....	22	5	1	28	6	0	0	22	21
West Virginia.....	4	2	0	6	0	0	0	6	0
Wisconsin.....	3	0	0	3	0	0	0	3	0
Total.....	244	43	20	307	134	0	1	172	44.3

<sup>1</sup> The column headed "Public" includes supplies owned by municipalities as well as those used by municipalities but owned by private companies.

<sup>2</sup> A "Private" supply refers to a small well or spring supply used only by the carrier and the person owning it.

### INTERSTATE SANITARY DISTRICTS

DISTRICT NO. 1.—MAINE, NEW HAMPSHIRE, VERMONT, MASSACHUSETTS, RHODE ISLAND, CONNECTICUT, NEW YORK, NEW JERSEY, AND PENNSYLVANIA.

Asst. Sanitary Engineer E. C. Sullivan continued in charge of this district.



The work was mainly a continuation of that in previous years. The major activities were: (1) Supervision of drinking and culinary water supplies on vessels, including investigations of the sanitary conditions, particularly with respect to the drinking and culinary water-supply systems and investigations of typhoid fever cases involving vessels; (2) control of drinking and culinary water supplies used by railroads, including inspections of sanitary conditions in railroad coach yards and terminals; (3) cooperation with State health departments in maintaining a uniform procedure for the certification of sources of water used for drinking and culinary purposes on interstate carriers, and in certain instances giving advice and assistance in State sanitary engineering problems; (4) cooperation with local health departments in the reporting of typhoid fever cases involving vessels and in the maintenance of rodent surveys and in other plague preventive measures; (5) miscellaneous activities, especially in connection with the enforcement of the Interstate Quarantine Regulations, and general public health work.

#### VESSEL WATER-SUPPLY SUPERVISION

Routine inspections were made of 126 vessels, 90 of which were passenger vessels and 36 were freight vessels and water boats engaged in the delivery of water to other vessels. Most of the interstate passenger vessels have had necessary improvements carried out during the past several years, so that they can now be regularly certified with but little delay. Changes made involved the storage of the drinking and culinary water in special tanks, the removal of cross connections between the drinking and culinary water-supply systems and other water systems aboard the vessel, the providing of special hose for the delivery of the drinking and culinary water to the vessel, and many other improvements of a minor nature. Based upon the inspections, favorable certificates of inspection were issued for 80 vessels during the year.

The Health Department of New York City has maintained its local supervisors of the water boats and excursion vessels in New York Harbor. Bacteriological analyses of samples of water obtained from the water boats have been made at various times during the year by the health departments cooperating in the local supervision of vessels. Among the health departments cooperating were the State Health Department of Massachusetts and the Health Departments of New York City and Philadelphia.

The cooperation with naval architects and shipbuilding companies, established during the previous year, was successfully maintained. Several conferences were held concerning the proposed designs of new vessels to be operated within the limits of this district. As a result, the designs of the drinking and culinary water-supply systems were much improved.

Eighty-three typhoid fever cases involving vessels were reported by the United States marine hospitals and local health departments as having been admitted during the year to hospitals located within the district. Seventeen of these cases occurred on vessels engaged in interstate traffic while 49 cases involved vessels engaged in foreign traffic. Inspections and investigations were made of the vessels in connection with 30 of the cases.

The number of typhoid fever cases and their distribution coincides fairly well with similar figures for the preceding fiscal year. (See Table III.) There were more cases and more vessels involved in 1924 than in 1923, but the number of cases per vessel is somewhat less than in the previous year.

Two of the large trans-Atlantic passenger vessels operated by the United States Shipping Board had small outbreaks of typhoid fever, involving eight passengers and members of the crew in one instance and six members of the crew in the other. Advice and assistance in regard to the prevention of further cases were furnished in both instances. Conditions with respect to the drinking and culinary water-supply system were not satisfactory and recommendations were made concerning the necessary improvements, which were carried out. Another American-owned trans-Atlantic vessel was involved in the occurrence of three cases of typhoid fever. An investigation showed the conditions aboard the vessel to be generally satisfactory. Measures to assist in the prevention of further cases were taken by the operating officials.

A nautical schoolship, while located in the Delaware River at Philadelphia, had two cases of typhoid fever develop among the members of the crew. A thorough inspection of the vessel revealed that a cross connection of a particularly dangerous type had recently been introduced between the overboard water lines and the drinking and culinary water system. The cross connection was promptly removed by order of the commanding officer when his attention was called to its danger.

TABLE I.—*Summary of typhoid fever cases*

	Fiscal year	
	1923	1924
Number of cases reported by United States marine hospitals or quarantine stations.....	47	55
Number of cases reported by local health departments.....	30	28
Number of cases in which conditions on vessel were investigated.....	33	30
Number of cases involving passengers.....	14	16
Number of cases involving crew.....	59	67
Number of foreign-owned vessels involved.....	21	20
Number of American-owned vessels involved.....	28	36
Number of United States Shipping Board vessels involved.....	5	5
Number of other Government-owned vessels involved.....	3	6
Number of cases involving vessels operating in interstate traffic.....	18	17
Number of cases involving vessels operating in foreign traffic.....	35	49
Number of vessels having more than one case.....	6	5
Average number of cases per vessel.....	1.33	1.24

There is room for considerable improvement in the methods employed aboard trans-Atlantic vessels in the handling of drinking, culinary, and ablutionary water. The water is often stored in the double-bottom tanks of the vessel. These double-bottom tanks may be filled with sea water by means of ballast pumps and other devices. It is not an uncommon practice to fill the double-bottom fresh-water tanks with sea water for ballast purposes when the fresh water has been expended. This practice may result in contamination of the fresh water the next time the tanks are filled, even though the tanks are flushed before refilling. A much better method of storing the water used for drinking and culinary purposes is to

provide a special set of tanks without sea connections or other connections whereby pollution may be introduced.

A new procedure has been devised for the routine collection and examination of samples of drinking and culinary water obtained from the various large passenger vessels controlled by the United States Shipping Board and operated in trans-Atlantic passenger traffic. Samples of this water are collected by the ships' surgeons from the tanks each time the vessels are docked at New York City in sterile bottles furnished by the Public Health Service. These samples are then delivered to the laboratory of United States Marine Hospital No. 70, where they are analyzed bacteriologically. The results of the analyses are then reported back to the ships' surgeon through this office.

During the week of November 5-10, 1923, a marine show was held in New York City. The district engineer arranged for an exhibit to illustrate the work of the Public Health Service in furnishing medical and surgical aid to seamen, and in foreign and domestic quarantine activities.

The district engineer represented the Public Health Service in the work of a special subcommittee appointed by the American Marine Standards Committee to consider drinking and culinary water supplies on vessels. This subcommittee will present its report to the entire committee during the next fiscal year. The references to the proper care of drinking and culinary water to be included in the code of operating practices will be of considerable value in improving drinking and culinary water on vessels.

TABLE II.—*Summary of vessel water-supply supervision*

Inspections:	
First inspections—	
Passenger	15
Freight	4
Reinspections—	
Passenger	75
Freight	32
Certificates issued:	
Temporary—	
Passenger	0
Freight	8
Regular, favorable—	
Passenger	56
Freight	16
Regular, unfavorable	
	0
Major conferences:	
With shipping officials	23
With others	15
Water analyses made at—	
United States Public Health Service laboratories	40
At other laboratories	8

#### RAILROAD WATER-SUPPLY SUPERVISION

Observations were made of the methods used by the railroads in supplying water to the coaches and dining cars. Thorough inspections were made of the coach yards of the New York, New Haven & Hartford Railroad and Boston & Albany Railroad at Boston, Mass. An inspection was also made of the Maine Central Railroad coach yard at Waterville, Me.

During the course of an extensive survey in September, 1923, of water supplies in the State of Maine used by interstate carriers, particular attention was given to ascertaining whether the sources of water supply reported by the railroads were actually used. The methods employed by the railroads in the handling of the water were also investigated.

Conferences were held during the year with various railroad officials in regard to providing equipment before June 30, 1924, for the separation of drinking water and the ice used for cooling. Recommendations were also made to the railroad officials for improvements in the coach yards, particularly in regard to cleansing the coolers.

TABLE III.—*Summary of railroad water-supply supervision*

Inspections:	
Sources of water supply.....	17
Coach yards.....	3
Major conferences:	
With railroad officials.....	5
With others (principally health authorities).....	12

#### MISCELLANEOUS

Conferences were held with officials of State health departments concerning the certification of water supplies used on interstate carriers.

In September, 1923, in company with the State sanitary engineer of Maine, surveys were made in that State of 14 public water supplies and 3 private supplies used by the railroads. Numerous improvements, particularly in increased use of chlorinating apparatus, have been made in the public water supplies of that State since the reestablishment of the division of sanitary engineering in the State health department.

About two months were spent in the spring of 1924 in making surveys of the organization and activities of a number of local health departments in connection with the collection of data for the Public Health Service office on municipal health department practice. Complete surveys were made of the health departments of Trenton, N. J., and Schenectady, Yonkers, and Troy, N. Y. Assistance was also rendered in making the surveys of New York City, Albany, and Utica, N. Y., by the collection of sanitary engineering data.

#### DISTRICT NO. 2.—DELAWARE, MARYLAND, WEST VIRGINIA, VIRGINIA, NORTH CAROLINA, SOUTH CAROLINA, AND DISTRICT OF COLUMBIA

From July 1 to September 15, 1923, this district was in charge of Asst. Sanitary Engineer I. W. Mendelsohn, and from the latter date to the close of the year it was under the direction of Asst. Sanitary Engineer A. P. Miller. The engineer located in this district, in addition to carrying on the work of the district, devotes a considerable amount of time to the general sanitary engineering work of the domestic quarantine division.

The district activities were mainly a continuation of the work started in the preceding four years and included: (1) Administrative duties in connection with sanitary engineering work of the division; (2) supervision of water supplies used for drinking and culinary

purposes on vessels, with special reference to the water-supply systems and the general sanitary conditions on the vessel; (3) cooperation with the State health departments in perfecting the procedure followed in certifying water supplies used by common carriers and in special investigations; (4) miscellaneous work relating to increasing the usefulness of sanitary engineering in public health work; and (5) publication of the Public Health Engineering Abstracts and the dissemination of public health engineering literature.

## VESSEL WATER-SUPPLY SUPERVISION

Considerable time was given to the inspection of new vessels before they were turned over to the owners by the shipbuilders. Such inspections took place while the hulls were still on the ways or immediately after they had been launched, thereby saving much time and expense, because changes in the piping systems could be made before the work was far along. In addition, plans of new vessels were reviewed and changes were requested in the piping systems.

Seven cases of typhoid fever on vessels owned by companies in this district were reported. Inasmuch as these seven cases were distributed over seven different vessels and were not accompanied by any unusual conditions, special investigations were not made.

Analyses of water samples taken from boats in this district were made by the laboratories of the following cities: Washington, D. C., 112; Norfolk, Va., 25; Baltimore, Md., 12. Steps are now under way to complete a cooperative arrangement whereby the work of a similar character will be done by the city laboratories of Wilmington, Del., Wilmington, N. C., and Charleston, S. C. These analytical data are of great value in connection with the investigation of the water-supply systems on the vessels.

At the end of the fiscal year all of the vessel companies in this district had not furnished data on their vessels, but complete information is recorded on 136 vessels belonging to 49 companies.

*Vessel water-supply supervision*

Inspection:	
First inspection.....	6
Reinspection.....	5
Certificates issued:	
Temporary.....	35
Regular (favorable).....	6
Regular (unfavorable).....	0
Major conferences:	
With shipping officials.....	7
With others.....	6
Water analyses:	
Public health service laboratories.....	0
Other laboratories.....	149

## RAILROAD WATER-SUPPLY SUPERVISION

All of the States in this district have sanitary engineers in the State health departments. South Carolina and Delaware have one engineer, and in North Carolina, Virginia, West Virginia, and Maryland the sanitary engineering work is carried on by well-organized bureaus. As a result, it is seldom necessary for the district engineer to assist these States in work which is purely of State character

In connection with the certification of sources of water supplies used by common carriers, visits were made to Delaware, Maryland, South Carolina, North Carolina, and West Virginia. In North Carolina and West Virginia assistance was rendered in establishing an office routine for the certification work which would be as nearly comparable to that used by the Public Health Service as possible. In South Carolina, several investigations were made of sources in company with the State sanitary engineer, and in Delaware help was given in solving difficulties in connection with the work. Many problems arise in carrying out the present procedure, and a few days with the State official designated to carry on this work results in mutual benefit.

*Railroad water-supply supervision during year*

Inspection:	
Sources.....	5
Coach yards.....	0
Terminals.....	0
Major conferences:	
With railroad officials.....	0
With others.....	7
Water analyses made.....	0

MISCELLANEOUS

The engineer in Interstate Sanitary District No. 2 serves as corresponding secretary of the Conference of State Sanitary Engineers and must necessarily carry on some work for that organization. The major portion of the work is in publishing the transactions of the annual meetings of the conference.

The Public Health Engineering Abstracts continue to be issued under the supervision of the district engineer. The following table gives pertinent data pertaining to the abstracts:

	Fiscal year ended—			
	June 30, 1921	June 30, 1922	June 30, 1923	June 30, 1924
Publications available.....	69	243	260	169
Abstractors.....	7	28	42	72
Weekly issues.....	27	52	53	51
Articles abstracted.....	231	611	743	976
Total number of copies issued.....	2,505	12,142	17,383	22,672
Mailing list.....	171	283	405	479

In addition to the Public Health Engineering Abstracts, 431 copies of 11 different technical publications were obtained and distributed among the sanitary engineers of the States.

DISTRICT NO. 3.—ILLINOIS, INDIANA, MICHIGAN, WISCONSIN, OHIO

Asst. Sanitary Engineer A. E. Gorman was in active charge of this district until March 1, 1924, from which date until the close of the fiscal year, he was on leave of absence without pay. During the latter period the district functioned without the services of an engineer until June 27, 1924, when Associate Sanitary Engineer J. I. Connolly assumed charge.

The activities of this district have been principally the supervision and control over the quality of water provided for drinking and culinary purposes on vessels and trains engaged in interstate traffic.

## VESSEL WATER-SUPPLY SUPERVISION

The vessels which came under supervision were those of American registry operating on the Great Lakes and the St. Lawrence River.

A step toward the ultimate complete supervision of all the Great Lakes vessels was gained on June 19, 1923, when the Governor General of Canada approved the Canadian regulations concerning water for drinking and culinary purposes on vessels navigating on the Great Lakes and inland waters. These regulations, which were prepared in cooperation with this service, were not effective until nearly a year after their approval. During this period Canadian vessels were expected to make improvements necessary to secure certificates of inspection, and no vessel to which the regulations were applied was permitted to leave port after the opening of navigation in 1924 without such a certificate. Reports indicated that, in general, satisfactory compliance with these regulations has been obtained.

The fullest cooperation of Federal, State, and local authorities has existed. The inspections of the purification apparatus, storage tanks, distributing and cooling systems, and placarding of other available supplies aboard vessels, as well as the inspection of docks, has been done, as before, by the representatives of this district.

The sources ashore from which water is taken by vessels have been investigated and tested by the State health authorities and certificates based upon their findings have been issued by the Surgeon General. The district engineer has compiled information, as required annually, regarding the sources of water taken from ashore, and forwarded it to the State health authorities for their guidance in making the investigations.

Six cities have cooperated by collecting and examining samples of water from the vessels. The results of the examinations are reported to the district engineer, who immediately sends reports of unsatisfactory water to the vessel company concerned, including recommendations in regard to disinfecting the tanks and piping system to free them of contamination. All the reports are tabulated once a month during the navigating season and sent to the respective vessel company.

The following table shows the number of samples collected and examined by the cities which are cooperating in this work:

Buffalo, N. Y., Department of Health.....	83
Chicago, Ill., Department of Health.....	851
Cleveland, Ohio, Department of Health.....	155
Detroit, Mich., Department of Health.....	428
Milwaukee, Wis., Department of Health.....	37
Toledo, Ohio, Department of Health.....	51
Total.....	1,605

An inspector was stationed at the locks in the American Ship Canals on St. Marys River at Sault Ste. Marie, Mich., from July 18 until October 1, investigating freight vessels as they passed through the locks. Other inspections were made at various Great Lakes

cities by a second inspector and by the district engineer. Several potentially dangerous conditions were corrected as a result of these inspections. It was found possible to issue a number of regular certificates of inspection this past year for the first time since the supervision of vessel water supplies was undertaken in this district. In general, the vessel companies exhibited a commendable desire to cooperate in making conditions aboard their vessels comply with the regulations.

Cooperation has also been maintained with the Canadian health authorities through the interchange of bacteriological reports of examination of samples of water from vessels and the inspection of vessels. One Canadian freighter which was inspected by the district engineer and found to be not complying with the American regulations had 12 typhoid cases, with 5 deaths among 21 men in the crew. Efforts were made to detect a typhoid carrier, but none was found, and the results were reported to the Canadian authorities.

A new chapter in water-supply supervision on Great Lakes vessels was written when during July and August seven Norwegian freighters entered the lakes from foreign ports via the St. Lawrence River and Welland Canal and called at ports in various States. These vessels were not equipped for treating water obtained from overboard and offered a serious health problem. On entering these fresh-water lakes the drinking-water tanks were filled by means of the fire system, which is a very dangerous practice. Notice to comply with section 19 of the Interstate Quarantine Regulations was served on the respective ship captains, and assistance was given in connection with same. American bills of health had not been obtained by the masters, who claimed that on arrival at Montreal the vessels terminated foreign service and entered inland river and lake service.

The entry of these foreign vessels to service on the Great Lakes suggests a health problem of the future which must be reckoned with if the Great Lakes-St. Lawrence waterways project is carried out. None of these vessels had been fumigated before entering American ports. Desertions of members of the crew of two of the vessels were reported, the seamen not having been examined at quarantine.

During the past year there were 21 cases of typhoid fever among seamen on Great Lakes vessels reported by the marine hospitals. Some of these cases gave histories of contact with other cases ashore, while others had been ashore much longer than the usual period of incubation of typhoid fever, so there are grounds for believing that even this small number is not wholly attributable to polluted drinking water.

The following table summarizes the typhoid-fever cases among Great Lakes seamen hospitalized at United States marine hospitals during the last 10 years:

Navigation season:	Cases	Navigation season:	Cases
1915.....	60	1920.....	20
1916.....	70	1921.....	13
1917.....	49	1922.....	17
1918.....	39	1923.....	25
1919.....	24	1924.....	21

It is interesting to note the relation between the numbers reported from vessels previously inspected by a Public Health Service repre-



sentative and from vessels not so inspected. The records indicate that far more vessels have been inspected than have not been, yet the numbers of typhoid cases from each class are nearly equal, being 11 for the former and 10 for the latter, respectively. This would indicate a much lower morbidity rate among crews on inspected vessels than on others.

The following table shows the distribution of cases and deaths among the various classes of vessels:

Type of vessel	Water supply from—	Cases	Deaths
Freighter.....	Distilled.....	8	1
Do.....	Sources ashore.....	4	0
Tug.....	Distilled.....	1	0
Passenger.....	do.....	0	0
Do.....	Ultra-violet ray sterilizer.....	5	1
Do.....	Sources ashore.....	1	0
Car ferry.....	Ozone sterilizer.....	0	0
Do.....	Sources ashore.....	2	0
Total.....	.....	21	2

The following table shows the distribution of cases according to occupation:

Cook.....	1	Deck hand.....	4
Lookout.....	1	Coal passer.....	4
Waiter.....	1	Fireman.....	6
Watchman.....	1		
Oiler.....	3	Total.....	21

The larger numbers in the classes working in the afterhold and between decks (oilers, deck hands, coal passers, and firemen) than of those working above (cooks, lookouts, waiters) is significant. The coal passers and firemen often drink untreated lake water from overboard through the hydrant used for wetting down ashes, while oilers have access to the jets on the bearings and pet cocks on pumps, also using raw lake water. Many deck hands indulge in the pernicious practice of dipping up water from overboard, even while in grossly polluted harbors. The result of taking water from such sources is manifested by the fact that 17 out of the 21 typhoid fever cases, or 81 per cent, last year came from these classes of the crew. Another indication that such typhoid fever as now exists on American vessels on the Great Lakes is due more to individual carelessness or ignorance than to lack of pure water supplies for drinking purposes is the fact that not more than one case was reported from any one vessel.

To cope with this problem, a meeting was held with the shore captains committee and with the welfare committee of the Lake Carriers Association, at which it was recommended that raw-water hydrants in fire holds be made less inviting for drinking purposes by running the pipe to the bottom of a barrel, so that the men could not drink from the hydrant or hose directly. It was further recommended that cool pure water be provided in fire holds. These recommendations are now being carried out by many of the vessel companies, and their accomplishment is being followed up during the inspections.

The only approach to an epidemic of disease that could be considered to be water borne reported during the past year from American vessels was an outbreak of diarrhea among members of the crew of the steamship *S. M. Stephenson*. This attack was traced to a water supply contaminated through a cross connection at a shipyard

where the vessel was in dry dock and using the yard-water supply. In this shipyard there were two water systems. In one, the drinking system, the water was from a safe source, while in the other, the dry-dock system, the water was from the shipyard slip, which was grossly polluted. The hydrants were not identified and consequently when, after a week's stay in the yard, the ship's water tanks were empty, they were unwittingly filled from the polluted supply. One of the typhoid-fever cases later came from this vessel and might be attributed to the same source.

As a result of the findings of the investigation made by this outbreak and of an earlier one, occurring before the beginning of the past year, a circular letter was written to all the shipbuilding companies in the Great Lakes district, recommending identification of fire hydrants and drinking-water hydrants both by distinctive coloring and by warning signs. Acceptance of this recommendation has been secured and action on it will be followed up. It seems likely that failure to identify hydrants in shipyards has been responsible for the typhoid-fever cases reported from vessels just prior to the opening and just after the closing of the navigation season, since the vessels are then being prepared for commission or for the winter tie-up and the crew is still aboard, taking water from the hydrants in the yard.

Another step toward preventing the contamination of drinking water on vessels through carelessness was taken when the officials of passenger vessel car ferries were requested to identify the drinking-water pipe lines on their boats by painting them light blue. This identification of pipe lines has been accepted generally, and since the opening of the 1924 navigating season, the number of accidental cross connections found between the drinking-water system and other water systems aboard vessels has been very small.

The 1923 season was a busy one for Great Lakes vessels, and it is estimated that 4,500,000 passengers were carried on them during the year, while more than 25,000 persons were employed in the crews. The importance of their supervision is indicated by the population which would be exposed during its travels on the lakes to ever-increasing danger as the amount of sewage from cities and vessels increases, while the success of the control is shown by the decrease in the typhoid fever case rate and death rate among the crews. The death rate among the crews last year was eight per hundred thousand, which, considering the many potential dangers to be guarded against and the large number of vessels each carrying a small group of men, compares very favorably with the average typhoid rates in rural communities where the population is similarly spread out in many small groups.

The following table shows the kind of treatment apparatus aboard passenger vessels, but does not cover freight vessels, as nearly all of the latter use distillation:

Vessels	Ruv. <sup>1</sup>	Dist. <sup>2</sup>	Oz. <sup>3</sup>	Sources ashore	Total
Passenger, regular:					
Intercity.....	29	7	2	17	57
Local excursion.....	1	0	0	1	2
Car ferries:					
Intercity.....	3	4	0	5	12

<sup>1</sup> Filtration and ultra-violet ray disinfection.    <sup>2</sup> Distillation.    <sup>3</sup> Filtration and ozone disinfection.

The following table presents a summary of the vessel work for the year:

Activity	Passenger	Freight	Total
Inspections:			
First.....	9	89	98
Reinspections.....	15	47	62
Docks.....	3	1	4
Certificates passed:			
Temporary.....	13	140	153
Regular, favorable.....	42	74	116
Regular, unfavorable.....	0	0	0
Major conferences:			
Shipping officials.....			16
Others.....			15
Water analyses made:			
United States Public Health Service.....	98	1	99
City health departments.....			1,605

## RAILROAD WATER-SUPPLY SUPERVISION

In connection with the separation of ice and water in drinking-water coolers on railroad trains much work was done in cooperation with railroad officials and manufacturers of cooler equipment. Assistance has been given in developing a practical type of cooler which will give the service desired and at the same time meet railroad conditions. A large number of designs submitted by cooler manufacturers and railroad officials were reviewed.

On September 11 the service was represented at the annual meeting of the committee of direction of the medical and surgical section, American Railway Association, at Chicago. At this meeting matters of policy concerning the supplying of drinking water to trains were thoroughly discussed. On October 17 a paper, "The handling of drinking and culinary water to railway trains," was read before the Association of Railway Surgeons at its annual meeting in Chicago.

*Summary of vessel inspections*

Inspections:	
Sources of supply for water.....	10
Coach yards.....	0
Terminals.....	0
Major conferences:	
With railroad officials.....	4
With others.....	13
Water analyses made.....	0

## MISCELLANEOUS

In connection with the investigation of a typhoid fever case reported by the Chicago Health Department in which the drinking water obtained aboard a vessel was suspected as the source of infection, information was obtained of a large number of cases of sickness among tourists who had traveled over the White Pass & Yukon route in southern Alaska and British Columbia. From information secured by circularizing the tourists who traveled over this route and by personal interviews with many who lived in the vicinity of Chicago it was learned that there had been a large number of cases of sickness among tourists who stopped off at the Atlin Inn at Atlin, British Columbia, about the middle of July. The source of infec-

tion of these persons was not discovered, but it seems probable that the sickness was caused by infected food eaten at the inn. The Canadian health authorities were advised of the findings as made, and the officials of the White Pass & Yukon route, who cooperated fully in connection with the investigation, were advised concerning general sanitary conditions on their vessels and trains and at their hotels.

In the latter part of November, 1923, during the outbreak of typhoid fever in the Hyde Park district of Chicago, a visit was made on invitation from Health Commissioner Herman N. Bundesen to all of the 10 waterworks pumping stations in that city to investigate the chlorination control over the public water supply. It was found that this control was unsatisfactory, and a report with recommendations for improvement was submitted to the health commissioner and the commissioner of public works. This typhoid fever outbreak was undoubtedly water borne.

DISTRICT NO. 4A.—TENNESSEE, KENTUCKY, FLORIDA, MISSISSIPPI,  
ALABAMA, AND GEORGIA

Due to insufficient personnel, this district has had no engineer. The vessels operating in interstate traffic on that section of the Mississippi River previously supervised from this district have been handled from district No. 5 as well as possible. However, the vessels on the South Atlantic coast below South Carolina have received no attention since May, 1923.

DISTRICT NO. 4B.—ARKANSAS, OKLAHOMA, TEXAS, AND LOUISIANA

Sanitary Engineer R. E. Tarbett, who is in charge of the stegomyia mosquito control along the Texas-Mexican border, has endeavored to carry on some supervision of vessel water supplies in this district. However, Mr. Tarbett's time is so completely taken up with the duties for which he was specifically detailed that very little work of a constructive nature has been accomplished.

The principal seaport in the district is New Orleans, La., and it has temporarily been detached from this district and placed under the supervision of district No. 5.

DISTRICT NO. 5.—MISSOURI, IOWA, MINNESOTA, NORTH DAKOTA,  
SOUTH DAKOTA, NEBRASKA, AND KANSAS

Associate Sanitary Engineer J. I. Connolly continued in charge of this district until June 25, 1924, at which time Asst. Sanitary Engineer A. L. Dopmeyer assumed charge.

The principal activities of this district are as follows: (1) Supervision over water supplies on vessels; (2) supervision over water supplies on trains; (3) cooperation with the State health departments; and (4) special investigations, inspections, and reports.

VESSEL WATER-SUPPLY SUPERVISION

The supervision over the water supplies used for drinking and culinary purposes aboard vessels on the Mississippi River and its tributaries has made notable progress. Extensive improvements

have been made in methods of handling, storing, and distributing water taken from ashore and in treatment of water aboard the vessel when taken directly from the river. This has resulted in improved sanitary conditions on the larger and more important vessels. Numerous vessels having short runs and carrying large numbers of passengers, such as ferries, have been prevailed upon to discontinue furnishing water. This is an improvement, since it protects the public health by guarding against the use of polluted drinking water, relieves the vessel owner of the necessity of securing good water and properly caring for it, and saves the Public Health Service the expense and labor of supervision.

The activities of this district during the past year have included the supervision of water supplies used by common carriers in the 7 States properly belonging to the districts, namely, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, and in 12 others, making a total of 19. These others are: Alabama, Pennsylvania, Louisiana, Mississippi, Indiana, Wisconsin, Arkansas, Tennessee, Ohio, Kentucky, Illinois, West Virginia.

In the latter group of States the supervision has been confined to water supplies of vessels. Two classes of vessels have been dropped from supervision, (1) those where a discontinuance of the furnishing of drinking water was secured and (2) those which, although coming within the provisions of the law and of the Interstate Quarantine Regulations, were considered to present so little menace to the public health as to warrant their temporary exclusion.

During the year 665 vessel owners were circularized whose vessels number in excess of 1,000. From these approximately two-thirds have been eliminated in the interest of greater efficiency, leaving on the active list 140 companies and 310 vessels. These figures are exclusive of United States Government vessels, over which no supervision is exercised but in the control of which cooperation to the fullest extent is offered.

Provisions for purifying river water aboard the vessels have made gratifying progress, and the discovery of a vessel where untreated river water is served can not be made among the more important vessels and is rare among the others. The Steamboat Inspection Service has rendered valuable cooperation in this work throughout the year. The great extent of the rivers, the large number of ports, and the absence of vessels from port at the time of inspection trips make it impossible to reach all the vessels for inspection every year. When this supervision was commenced three years ago the use of untreated river water for drinking was the rule rather than the exception. The number of vessels equipped for treating water aboard has largely increased in the last year, as shown by the following table:

*Common carriers equipped with purification apparatus*

Vessels equipped with—	2 years (1922-23)	Past year (1924)	Total
1. Stills or condensers.....	59	48	107
2. Ozonizers.....	2	0	2

An interesting and important part of the work has been the education of the members of the crews of vessels in the use of pure water rather than raw river water. Although such educational work is slow among some of the older river men, the progress among those of the younger generation is encouraging.

Owing to the improvements made and to the greater care exercised by the men on the vessels in caring for the drinking water, a close check by means of the frequent examination of samples of water has become somewhat less necessary. Accordingly, the number of cities or State health departments cooperating with this district in the collection and examination of samples has been reduced. The help of the following cities continues to be very useful, however: Wheeling, W. Va.; Cincinnati, Ohio; Louisville, Ky.; Lexington, Ky. (State laboratory); Paducah, Ky.; Cairo, Ill.; Memphis, Tenn.

When unsafe water is shown by the reports, the captain and owners of the vessel are promptly notified by mail and are given instructions for remedial measures. The master reports the steps taken and the check is made at the time of the next inspection.

Efforts have been continued to secure proper physical examinations of food handlers aboard the river craft.

Prospective vessel builders, naval architects, and others concerned have been kept informed as to requirements, so that water-supply tanks, distributing systems, and treatment apparatus may be properly designed and built, thus obviating necessity of later modification.

Sanitary conditions at docks in the various cities along the rivers where water supplies may be obtained from ashore have been carefully supervised throughout the year. This work has included supervision of the care and repair of hydrants, care of hose, provision of pipe lines on wharf boats, and care used in filling tanks aboard vessels from shore sources of water supply. In general, these matters are much better handled than formerly.

Conferences were held from time to time with the representatives of companies manufacturing water-purification apparatus in order to secure improvements in their products which would make them more suitable. Changes in stills manufactured by some of the largest producers have been made to render them more automatic and certain in their action.

The Engineer Corps of the Army is interested in furnishing good drinking water to the men on its vessels, and stills were designed for the Engineer Corps shops to construct from materials already on hand. Very satisfactory progress is being made in equipping the vessels with proper apparatus for treating water, or for storing it if obtained ashore, particularly in the St. Louis, Mo.; Rock Island, Ill.; Cincinnati, Ohio; and Memphis, Tenn., districts.

*Summary of vessel water-supply supervision*

Vessel companies circularized.....	665
Inspection of vessels:	
First inspections.....	167
Reinspections.....	195
Inspection of docks:	
First inspections.....	33
Reinspections.....	68

Conferences:	
With shipping officials.....	262
With health officials.....	128
With others.....	49
Typhoid fever cases.....	12
Noncompliance notices issued.....	41
Analyses.....	217
Certificates prepared:	
Regular, favorable.....	25
Regular, unfavorable.....	2

## RAILROAD WATER-SUPPLY SUPERVISION

Certification of railroad water supplies has progressed normally in all the States of this district which were in a position to do such work.

Coach-yard and terminal sanitation work has been vigorously prosecuted. Notable improvements have been made in the handling of water, ice, and other foods for passenger cars and dining cars and in the equipment for such handling. Further improvements are contemplated and await only the appropriation of the necessary funds by the railroads concerned. Some of the safeguards which originated in this work are now being used in other districts, and will probably be made standard equipment for entire systems.

The facilities for watering trains at terminals have been investigated at St. Louis, Mo.; Kansas City, Mo.; Topeka, Kans.; Omaha, Nebr.; Des Moines, Iowa; Minneapolis, Minn.; St. Paul and Duluth, Minn.; and at Fargo, N. Dak.

Efforts have been made to secure compliance with the requirements for the separation of ice and water in coolers. This work has been along two lines, first, checking up on the character of coolers on equipment found in coach yards and stations, and drawing the attention of railroad officials to any laxity or backwardness observed; and, second, by conferences with manufacturers of coolers to insure that their products are satisfactory from a sanitary standpoint.

In some of the coach yards all of the equipment for cooling water now meets the requirements. At others a few old-type coolers may still be found, but they are being replaced by the sanitary type as fast as the cars go to the shops for repairs.

Coach yards:	
Inspections.....	36
Conferences.....	41

## COOPERATION WITH STATES

During the past year this district has cooperated actively with all the States of the district, except South Dakota, from which no request for assistance was received.

In Missouri the State health department has taken vigorous steps to encourage good water supplies and adequate water-purification plants, distribution systems, and sewage systems. The district engineer addressed a mass meeting of voters at Festus, Mo., at the request of the mayor and council, to assist the State in this work. Assistance was also given to this State in its milk work at Kirksville. In Kansas, a school for mayors, health officers, water commissioners, filter-plant operators, city engineers, and councilmen was held under the joint auspices of the State health department and the University of Kansas, at Lawrence. The district engineer served

on the faculty of this school. The cooperative certification of common carrier water supplies and the relationship of the State health departments to the Public Health Service were explained.

A study, in conjunction with the States of Minnesota and Iowa, was undertaken, at their request, of the pollution of the Red Cedar River. An investigation was made of the sewage of Austin, Minn., where a large part of the pollution occurs, of the waste from the packing plant at that city, and of the conditions, physical, chemical, biochemical, and bacteriological, in the river for 40 miles below. This district also participated in the consideration of reorganization legislation pertaining to the Iowa State Health Department and consulted with representatives of the city of Duluth, Minn., relative to a study of the pollution of St. Louis River.

In each of these six States city water supplies were inspected during the year.

Cooperation with the State of Illinois was given in intrastate river vessel supervision. Although Illinois is not in this district, this was done because the vessels in question were of the type to be found most frequently in district five. A trip was made in company with an engineer of the State health department, during which intrastate vessels were inspected and shortcomings indicated. It is expected that the State supervision will induce these vessels to conform to the requirements for interstate carriers.

Conferences with State health officials.....	52
Public water supplies inspected.....	20
City milk campaigns participated in.....	1
Interstate stream-pollution studies.....	1

#### MISCELLANEOUS

Surveys of the public health administration in the following cities were made during the spring: Des Moines, Duluth, Minneapolis, Omaha, St. Louis, St. Paul, Sioux City.

Upon request of the medical officer in charge of United States Veterans' Hospital No. 92, Jefferson Barracks, Mo., a study of mosquito breeding around the hospital was made and control measures necessary were recommended.

Recommendations and advice were given to the Lighthouse Service, to the Army Engineer Corps, and to the Coast Guard, upon request, regarding sanitary engineering matters, particularly those relating to pure drinking water and safe excreta disposal.

DISTRICT NO. 6.—MONTANA, IDAHO, WASHINGTON, AND OREGON.

DISTRICT NO. 7.—WYOMING, COLORADO, NEW MEXICO, UTAH, ARIZONA, NEVADA, AND CALIFORNIA

Sanitary Engineer H. B. Hommon was in charge of these two districts, assisted by Asst. Sanitary Engineers L. D. Mars throughout the year and A. P. Miller to September 1, and by Associate Sanitary Engineer I. W. Mendelsohn after September 17. The work carried out during the year was divided as follows: (1) Cooperation with the States of the two districts in the examination of water supplies used on trains and vessels engaged in interstate traffic and in the investigations of special problems of sanitation; (2) cooperation with the National Park Service in improving sanitation in the national parks;



(3) examination of water-supply systems on vessels engaged in interstate traffic; and (4) special investigation and miscellaneous activities.

## VESSEL WATER-SUPPLY SUPERVISION

The inspection of vessel water-supply systems was carried out during nine months of the year. There are 471 vessels on the Pacific coast that come under the provisions of the Interstate Quarantine Regulations. These vessels were registered in ports along the Pacific coast, some of which are about 1,350 miles apart. On account of the large number of vessels, the long distances between ports, and the limited number of vessels in port at any one time, it is impossible for one sanitary engineer to inspect all the vessels on the Pacific coast in one year. During the past fiscal year 39 per cent of all the vessels coming under the provisions of the interstate quarantine regulations were inspected. During the last three years all of the large passenger vessels have been inspected and 60 per cent of the large freight-carrying vessels. All the large ferryboats on the San Francisco Bay and Puget Sound have been examined.

*Summary of vessel water-supply supervision*

Number of vessel companies affected by interstate quarantine regulations	124
Number of vessels affected by interstate quarantine regulations	471
Number of vessels inspected	183
Number of vessels reinspected	122
Number of favorable certificates issued	120
Number of typhoid fever cases from vessels that were treated in marine hospitals	15
Number of typhoid fever cases investigated	2
Number of cooks and waiters examined for typhoid carriers	18
Number of major conferences with steamship officials	13.

## COOPERATION WITH STATE HEALTH DEPARTMENTS

In Colorado the following work was done: (1) Surveys were made and reports prepared for 10 interstate railroad water supplies; (2) investigations and reports were made on methods of filling railroad coolers at nine places; (3) surveys were made of, and reports prepared for, additional water supplies for six cities and towns; (4) surveys and reports were made of sewage-disposal systems for eight cities and towns; (5) stream-pollution investigations and reports were made for two cities; (6) investigations and reports of nuisances were made for four cities and towns; (7) a draft of a general law for controlling water supplies, sewage disposal and sewerage, garbage and refuse disposal, and camps was prepared; (8) a draft of a law for creating a bureau of sanitary engineering in the State board of health was submitted to the State health officer.

In Nevada surveys were made and reports prepared for water supplies of 23 cities and towns that furnish water to trains engaged in interstate traffic. In Wyoming seven interstate railroad water supplies were examined, and in Utah a special report was prepared on the cause and remedy of taste and odors in the Salt Lake City supply.

## SANITATION AND MEDICAL ASSISTANCE IN THE NATIONAL PARKS

The assistance rendered the National Park Service at the request of the Secretary of the Interior in providing the necessary medical attention and improving the sanitary conditions in the national parks

was continued. Asst. Sanitary Engineer L. D. Mars spent three months on park sanitation; Asst. Sanitary Engineer A. P. Miller was stationed in Yellowstone from July 1 to September 1, 1923, and Associate Sanitary Engineer I. W. Mendelsohn from May 26 to June 30, 1924. Acting Asst. Surg. J. Meek Wolfe was on duty in Yellowstone during the entire year. The activities carried out in the various parks during the year were as follows:

*Yellowstone.*—A complete sewerage system with treatment plant designed by this district was installed at the Lake Junction. This plant receives the sewage from all the buildings and camps at the junction. The treatment plant consists of a settling tank with separate sterilization chamber and a small concrete building for housing the chlorine machine. At the Canyon Junction a sewerage system, settling tank, and sterilizing equipment were installed to take care of the sewage from the Canyon Hotel, and similar designs were prepared at the canyon for sewers, tank, and sterilizing apparatus for taking care of the sewage from the Government automobile camp, ranger stations, and the stores. At the Fishing Bridge, West Thumb, and Lewis Lake, plans were made for disposing of sewage from comfort stations. These works will be constructed during the next fiscal year. At the eastern entrance to the park a sewerage system and treatment plant were laid out and the detailed plans will be prepared by an assistant engineer of the Park Service.

Complete surveys of all the water supplies of the park were made and samples taken for bacteriological analysis. A special report on the supply at Mammoth Hot Springs was made, which included recommendations for improving the physical properties of the water. The water supplies of the park are satisfactory from a bacteriological standpoint, but in many places there is a shortage of water that must be met within the next few years. This is particularly true at the canyon, and surveys were made to locate a single supply that will be sufficient for all consumers at this junction.

The dairies supplying milk were inspected, and the reports indicate that the milk supplied to the park was of high quality throughout the year.

The disposal of garbage has always been a serious problem in the park, and beginning this year a clean-up program was started at all the old dumps and new burial pits were located at each junction. Bear feeding platforms were installed at the pits, and each day garbage that has been worked over is thrown into the pits and covered.

Mosquito-control work was carried out again this spring along the lines worked out last year. It was stated by the superintendent of the park that there was a very material reduction last year as compared with former years. With a more efficient organization each year and more funds available for drainage, it is believed that the mosquito nuisance can be practically eradicated at the nine important junctions in the park.

*Yosemite.*—The work in Yosemite during the year included the following activities: (1) Inspections of the sanitary conditions of all places handling, storing, and serving foods and soft drinks; (2) preparation of plans for remodeling bathhouses and inclosures around the two swimming pools; (3) design of an incinerator for burning garbage; (4) cooperating with the park civil engineer in the operation of the sewage-treatment plant; (5) bacteriological examination of

water and milk supplies and water flowing in Merced River above and below the sewage-treatment plant; and (6) the examination and report on two cases of typhoid fever that occurred at the same time among employees of the Government.

*Grand Canyon.*—On account of extensive improvements, probably amounting to more than two million dollars, that the Santa Fe Railroad and Fred Harvey Companies expect to make at the south rim of the Grand Canyon during the next few years, considerable time was spent at the canyon during the last year. The work in which this district has an interest is as follows: (1) The design of a sewerage system and a treatment plant to be built by the Government at an estimated cost of \$72,000 that will produce an effluent that can be used for boiler and irrigation purposes and for flushing toilets; (2) the construction of a new water-supply system by the Santa Fe Railroad at an estimated cost of \$300,000; (3) the disposal of garbage by incineration or feeding to hogs; (4) the design of a swimming pool; and (5) the problems of general sanitation.

At the north rim of the Grand Canyon a thorough survey was made of the water supplies, and recommendations were given as to the developments that can be made with the water supply available.

*Sequoia.*—A new and complete water-supply system was installed during the year under the general supervision of this district, and a sewerage system and treatment plant were designed in cooperation with an engineer of the Park Service and construction work started the 1st of June. General inspections of the sanitary conditions of the park were made. A garbage incinerator was designed and partially constructed at the close of the fiscal year.

*General Grant.*—A new water-supply system and a sewerage system and treatment plant were installed during the year and have proven successful in operation. Inspections of the sanitary condition of the concessions and Government automobile camps were made.

*Crater Lake.*—A complete sewerage system and treatment plant were designed to take care of the sewage from Crater Lake Lodge and the regular inspections of the sanitary conditions in the park were made. Analyses of the public water supply were made and recommendations given for increasing the amount of water delivered to the camp grounds and the lodge.

*Mount Rainier.*—The work done in Rainier consisted of the regular inspection of the sanitary conditions of the automobile camping grounds and the places handling and selling food, milk, soft drinks, and other food products. Recommendations were also made in regard to the development of a new and adequate water supply for all interests at Longmire and this district laid out a new water-supply line for the automobile camp.

*Glacier.*—A general survey was made of the sanitary conditions of all automobile camps and chalets in the park. Estimates were prepared for the cost of a sewerage system and treatment plant for the Government headquarters at Belton and the money was appropriated in June.

*Zion.*—The Union Pacific Railroad is anticipating an expenditure of about \$600,000 in this park for constructing a large hotel and camps. During the past year considerable time was spent in conference with Union Pacific Railroad engineers and Park Service

officials regarding plans for sewerage system, treatment plant, a new water supply, and garbage disposal.

*Bryce Canyon.*—The last Congress passed legislation which, under certain conditions, will change this canyon into a national park under the name of Utah National Park. In anticipation of this law being carried out, a visit was made to the canyon in June to inspect the plans for sewage and garbage disposal which were being worked out at the time for the building program then under way.

*Muir Woods.*—A general inspection of the sanitary conditions was made and recommendations given for improving the water supply and disposing of garbage and refuse.

### MISCELLANEOUS ACTIVITIES

The following activities were carried out during the year by the sanitary engineers attached to the two districts: (1) Preparation of a bulletin on camp sanitation; (2) design of an incinerator for consuming wet garbage from the hotels and camps in the national parks; (3) preparation of a report on sewage disposal and a water supply for the United States Veterans' Hospital now under construction at Livermore, Calif.; (4) service with the State of California Civil Service Commission to examine candidates for positions with the bureau of sanitary engineering of the State board of health.

### RURAL HEALTH WORK

In the fiscal year ended June 30, 1924, the Public Health Service cooperated in demonstration projects in rural health work in 72 counties, or districts comparable to counties, in 16 States, as follows: Calhoun, Colbert, Franklin, Lauderdale, Limestone, Madison, Talladega, and Walker Counties, Ala.; San Joaquin district, Calif.; Clark, Decatur, Floyd, Glynn, Laurens, Miller, Seminole, and Walker Counties, Ga.; Dubuque County, Iowa; Cherokee County, Kans.; Mason County, Ky.; De Soto and Washington Parishes, La.; Cape Cod district, Mass.; Harrison and Washington Counties, Miss.; Dunklin, Gentry, Greene, New Madrid, Nodaway, Pettis, Polk, and St. Francois Counties, Mo.; Cascade and Lewis and Clark Counties, Mont.; Bernalillo, Chaves, Eddy, McKinley, Santa Fe, Union, and Valencia Counties, N. Mex.; Edgecombe, Sampson, and Surry Counties, N. C.; Ottawa County, Okla.; Arlington, Caroline, Carroll, Charlotte, Chesterfield, Grayson, Greene, Greenville, Henry, Madison, Mathews, Nansemond, Prince Edward, Pulaski, Roanoke, Smyth, Spotsylvania, Stafford, and Wise Counties, Va.; Hancock, Harrison, Logan, Marion, Preston, and Taylor Counties, W. Va.

The plan of the work was the same as that followed in each of the several preceding fiscal years and is described in previous reports. The results are favorably comparable to those obtained in the fiscal year 1923. A detailed account of the activities and results will be published in Public Health Reports as soon as compilation of the data now being obtained from the field projects can be completed.

The appropriation "for special studies of and demonstration work in rural sanitation," with which the cooperative rural health work of the Public Health Service was conducted, was \$50,000 for the fiscal year 1924. At the termination of the fiscal year 1923, \$10,817.82,

unexpended under contracts made in that year, remained. Thus \$60,817.82 was available for support of the activity in the fiscal year 1924. Of this sum \$43,584.52 was expended under agreements with State and local authorities in the 72 cooperative demonstration projects, and \$4,443.69 was expended for administration, supervision of the demonstration projects, and special studies of the problem of rural sanitation. The unexpended balance of the total sum available was included in allotments to some of the cooperative demonstration projects which, because of various local circumstances, could not be completed by the end of the fiscal year. With the existing differences between the Federal fiscal year and those of some of the States and localities in which the work was done it would not be practicable without lessening the degree of economy striven for to arrange contracts so that the allotment of Federal funds to every project would be expended exactly by the end of the Federal fiscal year.

Along with the \$43,584.52 of Federal money expended, about \$540,000, provided mainly from State and county sources, was expended for support of the work in the demonstration projects. Thus, this investment of Federal funds was met with odds of over 12 to 1. Through remarkably successful efforts at economy in the investment of Federal funds the service has been enabled in some instances to develop and thoroughly participate in highly successful demonstrations by making allotments ranging from only \$300 to \$1,000 to the projects.

Among the results obtained in the demonstration projects are improvement in home sanitation, providing more wholesome, more comfortable, living conditions; lowered sickness and death rates; improved general health; increased vigor; and conservation of economic resources. Furthermore, the development and maintenance of whole-time reasonably adequate local health service, which the demonstration work promotes, furnishes the most economical and the most effective means for the prevention of the spread of human infections between the States and from other countries to the United States.

A careful study of the results obtained from the cooperative rural health work of the Public Health Service indicates beyond reasonable doubt that they are of far-reaching and fundamental importance, and that the money invested for this activity yields as much to the general welfare of the people as comparable investments for the support of any other activity with which the Federal Government properly may be concerned.

#### MOSQUITO CONTROL ALONG THE TEXAS-MEXICAN BORDER

In the annual report of 1923 the yellow fever prevention problem was rather thoroughly discussed, together with the plan of work to be followed if fairly adequate protection of the Mexican border district was to be attained. In the main the plan of work as outlined has been followed, and the work has been extended into the various sections thought to be important.

Increased knowledge of the conditions existing, particularly as to the extent of illegal entry of Mexican aliens and the movement of these aliens once in the United States, indicated the necessity of control

work over a fairly wide area immediately adjoining the border and allowed for the exclusion of the coastal area north of San Patricio County. With the exception of a small amount of work carried on in Galveston during the 1923 season, efforts have been confined to the three ports of entry, El Paso, Del Rio, and Eagle Pass; to all communities in the counties bordering on the Rio Grande River from Webb County to its mouth, namely, Webb, Zapata, Starr, Hidalgo, and Cameron; to the larger communities in the counties to the north, Jim Hogg, Brooks, Kennedy, Willacy, Kleberg, Duval, Jim Wells, and Nueces; and to San Antonio and the larger communities on the highway between San Antonio and Laredo. To the above should be added San Patricio County, lying to the north of Nueces County, in which county work has been planned, but not as yet started.

This critical area, within which a majority of aliens, both Mexican and European, remain for at least six days after entering the United States, is very extensive, covering approximately 26,000 square miles, and has a population of approximately 475,000, of which about 40 per cent are Mexican or of Mexican parentage.

Any attempt to introduce *Aedes aegypti* mosquito control into communities where a public demand for mosquito-control work does not exist and where other species of mosquitoes abound is necessarily difficult and, strange as it may seem, the difficulty increases as the percentage of non-Mexican population increases.

During the year it has not been possible to extend the work to all of the communities within which it was considered advisable, while in others work has been more or less intermittent. As a whole, however, the results obtained have not only been satisfactory but have exceeded the expectations.

In so far as yellow fever prevention is concerned, three things have been accomplished. First; a knowledge of mosquito breeding in all communities within the area has been obtained, both where work has been undertaken and where no work has been done; second, more or less efficient *Aedes aegypti* control has been maintained in the most important areas; and, third, a small force, available for any emergency that might arise, has been trained.

The outstanding features of the work during the year have been the increasing interest shown in *Aedes aegypti* control and also in the general mosquito-control problem, including malaria carriers; and an increasing interest in public-health work generally. The latter is most necessary if the permanent results desired are to be obtained.

The increasing acreage being developed in the section outlined above will necessitate an additional supply of labor during the summer season, which will be met through increased immigration from Mexico. This type of immigration is usually of a temporary nature, but is important from a public-health standpoint.

The revolution which has occurred in Mexico during the past year may also be a potential danger due to a possible increase in the number of laborers coming from the lower east coast States of Mexico, in which the revolution has been most active and in which yellow fever has in the past been more or less endemic.

Another potential danger exists through the illegal entry of European aliens, which danger will undoubtedly be increased with the execution of the new immigration law. From the standpoint of yellow fever introduction, the success or failure of the attempts of

these aliens to enter this country is not particularly important, because under any conditions they will reach the border and the introduction of the disease into any of the Mexican border communities would allow for its introduction into this country.

#### AREAS IN WHICH CONTROL WORK IS BEING CARRIED ON

*El Paso.*—General mosquito work in El Paso is now on a permanent basis, and the city is being maintained relatively free from mosquitoes of all species.

The service officers are still acting in an advisory capacity in connection with this work, which is now being carried on by a separate department of the city government created for the purpose.

*Del Rio.*—This city is not as important from the standpoint of yellow-fever prevention as are the cities on the lower river. However, since it is a port of entry it is advisable to encourage some work toward the control of the *Aedes aegypti*. Occasionally visits were made during the 1923 season, the city itself carrying on a small amount of work and obtaining fair results. Beginning with April of the present year arrangements were made for periodic inspections with a check-up inspection by one of the service inspectors each month.

Much better results are being obtained than were possible in 1923, and the report of June, 1924, showed that efficient control was being maintained. This city has a small malarial problem relative to which control measures are being instituted.

*Eagle Pass.*—Work in this city was considered relatively important since this is a port of entry with direct rail connections to the east coast of Mexico. During the 1923 season work was rather intermittent and not entirely satisfactory.

Arrangements were made in April, 1924, for periodical inspections, as in Del Rio, and recent reports show that good control is now being maintained.

*San Antonio.*—As San Antonio is the objective point for a considerable portion of the Mexican and European aliens who enter through the Laredo district, it is particularly important in connection with control work.

Conditions suitable for mosquito breeding, both as to containers and ground pools, exist throughout the city, and mosquito production of all kinds is prolific. *Aedes aegypti*, as well as the *Anopheles*, breed in all parts of the city. The problem, therefore, is one of general mosquito control.

An inspection of San Antonio in July, 1923, showed that 70 per cent of the city blocks contained possible container breeding places, the percentage varying from 96 per cent of the blocks, with an average of seven breeding places per block, in the Mexican section to 57 per cent in the best residential sections, with an average of two per block. In addition to these conditions, breeding places, ground pools, and small streams are found throughout the city.

Work was started in this city in July, 1923, but, due to lack of interest on the part of the city officials and the citizens, it was allowed to lapse in September, following which there was an epidemic of dengue of considerable proportions. The number of cases, however, can not be stated, since dengue is not reportable in this city.

The malaria problem in this city is one of sufficient magnitude to warrant control work. Since malaria is not reportable, the number of cases occurring each year can only be estimated. The fact that the deaths average about 12 per year would indicate that the cases exceed 3,000 annually. Both *Anopheles quadrimaculatus* and *Anopheles pseudopunctipennis* are found, with *pseudopunctipennis* predominating.

Work was again undertaken in May of this year and is progressing fairly satisfactorily. It is believed that there will be no interruptions and that the work will continue to progress. At the start of the work in 1923 very satisfactory results were obtained through the cooperation of the fire department, and this organization will be used again this season. It is hoped that through their cooperation more efficient control over container mosquito breeding may be obtained. Lack of finances has made it necessary in this city to utilize all of the various city departments where possible.

*Devine, Pearsall, and Cotulla.*—It was thought advisable to encourage control work in these three communities, since they were located on the railroad and main highway between Laredo and San Antonio and because they were each the center of a rather large agricultural section which is being rapidly developed. These three communities were interested in the work at the beginning of the present season, and arrangements were made for weekly inspections by local inspectors with a monthly inspection by one of the service inspectors. The June, 1923, reports show considerable improvement as to mosquito breeding.

*Laredo, Webb County.*—Due to the growth of this city, the work has been increased to a considerable extent, although this has been offset by the enormous reduction in water containers caused by the paving of the streets and the installation of a sewer system. Water mains have been extended and the discontinuance of water barrels has been required where city water was available. This has allowed for the elimination of water barrels throughout the most thickly settled section of the city. Protection of existing water barrels has been required, and breeding in water barrels is at present practically nil.

More efficient methods for general mosquito control have been instituted and the cost over the methods formerly employed by the city greatly reduced. The entire mosquito-control problem is now being carried on under the direction of the inspectors stationed in this city.

*Other communities.*—The only other communities of importance in Webb County are Dolores, a mining town, and Mirando City, located in the oil field. These two communities are being visited only occasionally, since very excellent control is being maintained. In Dolores this work is being supervised by the company doctor, while in Mirando City a deputy sheriff is acting as the sanitary officer.

*Zapata County.*—The communities of San Ygnacio and Zapata, located on the river, are of particular importance, since both are ports of entry and because of the large amount of illegal crossing taking place in this county. While these communities are without a public water supply and depend on water carriers with water barrels for storage, conditions in so far as mosquito breeding is con-



cerned are extremely good and only occasionally visits are made. Irregular inspections are made also by the quarantine guard stationed in this county. The absence of container mosquito breeding is largely due to the educational work of a physician residing in San Ygnacio and practicing in both communities.

*Starr County.*—Due to the amount of illegal crossing taking place into this county, it has been considered one of the most important sections in which to carry on work. There are some 17 communities located along the river and, with the exception of Rio Grande, they have a population which is 100 per cent Mexican.

Rio Grande, the county seat, has a population of about 3,000, of which all but about 50 are Mexicans or of Mexican parentage. This city is the only one in the county having a public water supply. This water system can care for only a portion of the population, the balance depending entirely upon the water carrier for water.

With the exception of Rio Grande City work in this county was started in September, and in so far as breeding in water containers is concerned most excellent results have been obtained.

In most of the villages 100 per cent of the water barrels are protected, and since January, 1924, relatively few water containers have been found with mosquitoes breeding therein. Particular mention might be made of the villages of Hacha and Los Cueros, both typical Mexican villages, located miles from the nearest railroad and off the main highway. At every inspection made since January, water containers have been found free from mosquito breeding and all water barrels have been found protected.

The county has a small malaria problem due to overflowing conditions along the river.

*Hidalgo County.*—This county is perhaps equally as important as Starr County from the standpoint of the entrance of aliens, the upriver section being a particularly favorable crossing place for those entering illegally. There are 10 incorporated and some 13 unincorporated communities. During 1923 arrangements were made in all incorporated places for some routine inspection by local inspectors with inspection at periods from two weeks to one month, depending upon the efficiency of the local inspection, by the service inspector. The county maintained one inspector upon the work, who cooperated with the service inspector, covering both the incorporated and unincorporated communities.

In the latter part of the season the county inspector was discontinued, which made it impossible to carry on the routine inspections of all the unincorporated communities, although considerable routine inspection was continued in those which appeared the most important.

Work was discontinued in some of the incorporated communities during the winter, and these have been rather slow in again taking up the work, due in some instances to negligence on the part of the city officials. By the latter part of June, however, all the incorporated communities with the exception of one have again undertaken the work, and it is expected that that one will again resume the work.

The malarial problem is rather great in this county and will seriously interfere with the agricultural development unless steps are taken to combat it. This problem is caused largely by agricultural development and the extension of roads. The control problem, therefore, is

not an extremely difficult one, nor would it be prohibitive from a financial standpoint.

Much more interest is being taken in *Aedes* and general mosquito control than was evident during 1923.

*Cameron County, Brownsville.*—Work has been continued in Brownsville throughout the year with a great improvement in conditions. Water barrels have been greatly reduced, although at present there is an excessively large number of these in use. Fortunately, however, it has been possible to have more than 90 per cent of these barrels protected.

General mosquito work has been extended somewhat over that carried on in 1923, and more efficient methods have been adopted. The city is attempting some drainage which should materially affect breeding conditions, but this work has been considerably interfered with by periodic and heavy rains and flood conditions in the river.

The general mosquito and malaria problems are very important in this city, and satisfactory control over container breeding will be possible only with general mosquito work.

*Other communities.*—Work has been carried on in three incorporated communities and four unincorporated communities, with very satisfactory results. The incorporated communities are showing much more interest in the work and good control is now being maintained.

This county, as is the case in Hidalgo County, has a considerable malaria problem and a much greater pest-mosquito problem. However, much more interest is being shown in general mosquito-control work and it is expected that this will develop into actual control work.

*Kennedy and Willacy Counties.*—No attempt has been made to carry on control work in the two small communities located in these counties. However, surveys have been made and existing conditions are known.

*Brooks County.*—Control work was instituted at Falfurrias, the only community in this county, during the summer of 1923, continuing until November and starting again in April of this year. Work was considered necessary in this community since it is located on the one main highway connecting the valley section with the district to the north.

*Kleberg County.*—The northern part of this county is in the cotton district, which district requires a large amount of Mexican labor during the cotton-picking season. Work has been carried on at Kingsville and Riveria throughout the year.

*Nueces County.*—This county is the center of the cotton district and is of considerable importance, particularly during the summer season.

Corpus Christi is considered as second in importance to San Antonio in so far as cities not directly upon the border are concerned. Work has been carried on in Corpus Christi and in Robstown only. However, surveys have been made of all other small communities in the county.

*Corpus Christi.*—Work was started in Corpus Christi in June, 1923, and carried on until the 1st of October, when, due to lack of finances, the city discontinued it. The work was taken up again on the 1st of June, 1924, and the manner in which it is being pushed indicates that it will continue.

*Robstown.*—Robstown carried on very effective control work throughout the 1923 season, but it has been allowed to lapse. As this city is a ginning center, it is hoped that the work will again be taken up and continued.

*Jim Wells County.*—Control work was instituted in Alice, the only community of any size, in August, 1923, and has been continued since that time.

Surveys have been made in the other small communities located in this county.

*Duval County.*—Work was instituted in two communities in this county in July, 1923, and has been continued since that date with fairly satisfactory results.

*Jim Hogg County.*—Hebbronville, located on the Texas-Mexican Railroad, is the only community of any size in this county. No attempt was made to institute work during the 1923 season. The work, however, was started in June, 1924.

*San Patricio County.*—This county is considered to be of considerable importance, due to the great influx of Mexican labor during the cotton-picking season. It has not been possible as yet to have work started, although surveys have been made of all the communities preparatory to interesting them in carrying on the work.

*General.*—In so far as container mosquito breeding is concerned, the district differs from other portions of the United States, in that water is delivered to a considerable portion of the population by water carriers and is stored for use on the premises in water barrels. While the incorporated communities for the most part have water systems, these are not sufficiently extensive to reach all of the population and as a rule are not extended into the Mexican colonies.

Shallow ground water is generally alkaline, which eliminates to a considerable extent the use of the shallow dug well. In the coast region, where rainfall is more abundant, rain-water cisterns are used to some extent, but in the balance of the region they are used very little. In some of the sections deep wells are used with the overhead tank for storage. The number of smaller containers holding water varies, being most numerous after rains.

In Brownsville and Corpus Christi rain-water cisterns are extremely numerous and are used to a considerable extent, even though both cities now have a most excellent public water supply. These cisterns are a survival of the period when city water supplies were not available, and the older residents feel that they must maintain the cistern even though in many cases the water is not used.

*Methods.*—Methods employed in controlling breeding have been those which would cause the least inconvenience and expense to the property owner in order that immediate cooperation, with fairly efficient control, might be obtained.

In the incorporated communities the passage of the model mosquito ordinance has been obtained and as far as possible weekly inspection of premises instituted. Inspections by service inspectors have been carried on at intervals, depending upon the area which the inspector is attempting to cover and the efficiency of control which the local authorities are maintaining. In the larger cities the work is being directed by service inspectors.

In so far as possible the work is being carried on through inspections and education of the individual householders. Court action is taken only in aggravated cases. Where water barrels are unnecessary they have been eliminated, but where necessary simple methods of protection have been necessary, keeping the barrel covered with a fine-mesh cloth held in place by a loose iron hoop has been recommended. While a more permanent top with a spigot for drawing water has been advocated, it has been found that much more efficient results can be obtained through the simple protection before mentioned. With this protection it is only rarely that barrels are found to contain mosquito larvæ.

On inspection, any water barrel found with larvæ is summarily emptied. This procedure is modified in one community by treating with oil, if this is not objectionable to the owner, while in one of the other cities all water barrels which are not protected are summarily emptied, whether they contain larvæ or not. By this method a small fine is automatically placed upon the owner, since the cost of a barrel of water varies from 15 to 35 cents. Since the cost of protecting a barrel is practically nil, the owner soon finds that protection is the cheaper of the two.

The protection of cisterns, wells, and tanks must be of a nature that will obviate routine inspection, since inspection of this type of container is naturally rather difficult and time consuming. It has been found that deep wells in use and elevated tanks into which water is being pumped more or less constantly from deep wells are not conducive to breeding and are rarely found to contain larvæ. These, therefore, have not been considered.

Shallow wells, underground cisterns, and above-ground wooden-tank cisterns are protected by the introduction of *Gambusia affinis*. The supplying of fish in these cisterns, wells, and tanks has been carried on by the inspectors and not left to the individual owner.

Above-ground metal-tank cisterns, due probably to the temperature of the water during the summer, can not be protected by the introduction of fish, and therefore screening or weekly oiling must be resorted to. Efficient screening, while possible, can be obtained only in a relatively few cases, and it has been found much more effective to have these cisterns oiled weekly.

Small containers, such as cans, tubs, old automobile casings, etc., can be controlled only through routine inspection. As the work continues, however, these small breeding places become fewer in number, due to better care being taken by the individual householder as well as improved collection of trash by the communities.

The most important part of the work consists in the education of the individuals, and the success of the work so far has been due more to the increased knowledge of the individual relative to mosquitoes and their habits than to any enforcement of laws or regulations.

*Results.*—During the year the inspectors have reported on the investigation of 624,421 premises, not including the work in El Paso, San Antonio, and Galveston. The inspection of water containers covered 124,225 water barrels, 48,893 cisterns, wells, tanks, etc., and 67,340 other containers, making a total of 240,458 water containers. These inspections do not cover inspections made by local inspectors, except when these local inspectors were working with the service inspectors.

Table I lists the various communities, El Paso and San Antonio excepted, in which control work was being carried on at the close of the fiscal year and gives certain data relative thereto.

The more permanent water containers, such as barrels and cisterns, tanks, wells (listed as cisterns), existing at the start of the work and at the last inspection are shown, as well as the number which are now protected against the entrance of mosquitoes.

The reduction in the number of water barrels has been marked, being largely due to the policy of prohibiting the maintenance of water barrels when a public water supply was accessible and not more than two barrels to a family where a public water supply was not accessible. Further reduction in water barrels will be possible only through extension of the public supplies. The high percentage of water barrels and cisterns, tanks, and wells protected against the entrance of mosquitoes is indicative of the cooperation which is being obtained from the individual householder.

Making a comparison of conditions existing in the various communities at the beginning of the year (July, 1923), or at the time of beginning control work, if later in the year, but excluding those places where work was not started until 1924 and those places where work was stopped and not again started until June, 1924, we have the following results:

*Comparison of conditions in July, 1923, with June, 1924*

	July, 1923	June, 1924
Percentage of premises having water containers.....	39.50	31.10
Percentage of containers in which mosquito breeding was found.....	10.25	7.00
Percentage of containers actually producing mosquitoes.....	2.25	1.75
Percentage of premises upon which containers breeding mosquitoes were found.....	4.05	2.18
Percentage of premises upon which containers actually producing mosquitoes were found.....	.89	.55

It will be noted that there is considerable reduction in the percentage, and this notwithstanding the fact that during the 1923 period covered by the summary rainfall was slight, while during the latter part of May and June, 1924, the entire area was subjected to frequent and extremely heavy rains.

*Conclusions.*—While the work has progressed in a very satisfactory manner during the year, its ultimate success will depend upon the establishment of permanent control measures. This can be accomplished only through the inauguration of general mosquito control and of active full-time health departments capable of carrying on the work.

This latter phase of the work has not been neglected, and considerable advancement has been made toward improved public-health activities. Health officers have been appointed where none existed and more interest is being taken in matters pertaining to public health.

Border quarantine as a guard against the entrance of communicable diseases can by the very nature of things be only partially effective. Hence encouragement and assistance in the establishment of effective public-health organizations in this district will provide an additional safeguard against the entrance of these diseases. It

would appear, therefore, that cooperation with the border States and communities might well be within the province of the Federal Government, since it is the duty of the Federal Government to prevent the entrance of and interstate spread of communicable diseases.

#### SMALLPOX OUTBREAK IN DETROIT, MICH.

In the spring of 1924 there occurred an outbreak of smallpox in Detroit, Mich. At the request of certain cities that feared the interstate spread of the disease, the Public Health Service instructed Senior Surg. C. C. Pierce to proceed to Detroit to investigate the situation.

It was found that during the period March 15, 1924, to June 1, 1924, a total of 795 cases of smallpox occurred in Detroit with 105 deaths. The city department of health appeared to be in complete control of the situation and was carrying on an intensive vaccination campaign.

#### SUPERVISION OF INTERSTATE TRAVEL OF DISEASED PERSONS

The supervision of the travel of diseased persons on common carriers in interstate traffic and the transportation of things from disease-infected localities, together with general sanitary conditions on the carriers, has been continued as provided for under the Interstate Quarantine Regulations.

#### SANITARY INSPECTION OF GOVERNMENT BUILDINGS

Inspections of the sanitary condition of Government buildings in the District of Columbia, excepting those of the War and Navy Departments, were made during the first half of the fiscal year, in accordance with Executive Order No. 1498 of March 15, 1912. The inspections were made by Surg. W. S. Bean and Passed Asst. Surg. A. A. S. Giordani, and appropriate recommendations and suggestions were made. Excellent cooperation was given by those responsible for the care of the buildings, although inadequate appropriations have prevented the carrying out of many recommendations for improvement.

During inspections all insanitary and unhygienic conditions, such as overcrowding, congestion, improper ventilation, insufficient lighting, poor water supply, lack of cleanliness, and unsatisfactory plumbing, were noted. Defects were pointed out during inspections, and a written report was made after each inspection, addressed to the Secretary of the department under whose jurisdiction the building came, and a copy forwarded to the Secretary to the President.

Cooperation of employees is an important factor in securing sanitary improvements, and much can be accomplished by obtaining the assistance of the employees through their good will and by enforcing regulations for the care of the buildings.

# DIVISION OF FOREIGN AND INSULAR QUARANTINE AND IMMIGRATION

In charge of Asst. Surg. Gen. J. D. LONG

## QUARANTINE TRANSACTIONS

During the fiscal year 1924, officers of the Public Health Service engaged in the administration of the United States quarantine laws inspected 19,309 vessels and 1,914,075 passengers and members of crews at the continental maritime stations. At insular stations 3,048 vessels and 340,021 passengers and members of crews were inspected. At foreign stations 6,810 vessels and 999,256 passengers and members of crews destined for ports of the United States were inspected. There were 4,896 vessels fumigated or disinfected at continental stations, 414 at insular stations, and 2,033 at foreign stations. At the border quarantine stations there were 80,160 travelers inspected, exclusive of the local interurban traffic.

## GENERAL PREVALENCE OF QUARANTINABLE DISEASES

*Cholera.*—As usual, cholera prevailed throughout the Orient during the entire year, over 30,000 deaths from this disease being reported from India alone during the first six months of 1924. The outbreak in Europe, reported last year, appears to have subsided, since no cases were reported from that continent except in the city of Constantinople. As a result of preventive measures applied by the service at the ports of departure, the United States was not menaced by this disease.

*Plague.*—The recrudescence of plague reported last year continued without abatement; especially in India, Peru, and northern and southern Africa the number of cases and deaths continued high. The antiplague measures applied by the service at foreign and domestic ports were wholly effective, so that no case of plague arrived at quarantine at a port in the United States.

*Smallpox.*—This disease continued to prevail throughout the world, including the United States. A rather sharp outbreak of hemorrhagic smallpox at Windsor, Canada, early in 1924, caused the institution of a vigorous campaign of vaccination at Detroit, Mich. The practice of vaccinating all persons arriving from smallpox-infected areas before admitting them into the United States was continued.

Because of the prevalence of smallpox in Pacific coast ports of the United States, the board of health of the Territory of Hawaii issued a regulation, effective June 21, 1924, requiring that all persons arriving from these ports must have been successfully vaccinated or, in lieu thereof, be subject to detention to complete 14 days from the date of embarkation. The United States quarantine officers at Honolulu were requested by the Territorial health officer to assist in the enforcement of this regulation.

Twenty-four cases of smallpox were apprehended upon arrival at quarantine in the United States and its insular possessions.

*Typhus fever.*—Reports indicate that the incidence of typhus fever in the countries of eastern Europe is gradually declining. The disinfestation of passengers from the typhus-infected countries prior to embarkation at European ports has effectually prevented the introduction of this disease into the United States. But one case of typhus fever arrived at quarantine during the year.

*Yellow fever.*—Prior to the beginning of the close quarantine season a circular letter was addressed to the medical officers in charge of the national quarantine stations advising that in view of the fact that no authenticated cases of yellow fever had been reported for a number of months from any of the seaports of Mexico, Central America, South America, or the West Indies, until further notice these ports would be considered as free from that disease. The fact that no case of yellow fever came to quarantine during the year appears to indicate that this change in procedure was warranted.

The epidemic reported at Bucaramanga during the previous fiscal year continued throughout the summer of 1923. Occasional cases are still reported from Bahia and Pernambuco, Brazil, and in May, 1924, an outbreak at Porto Novo (French Dahomey), West Africa, was reported.

During the last month of the fiscal year several cases, with two deaths, of a disease suspected to be yellow fever occurred at San Salvador, Salvador, Central America. These cases were investigated by a medical officer of the Public Health Service, who recommended further study of the outbreak.

#### CHANGES IN QUARANTINE PROCEDURE

*Plague.*—The arrangement with the British Ministry of Health providing for the acceptance by quarantine officers at United States ports of fumigation certificates issued by British health officials and viséed by American consuls or accredited medical officers of the United States was extended to include the Scottish ports of Edinburgh (including Leith), Dundee, Aberdeen, Glasgow, and Greenock.

The use of the cyanogen chloride gas mixture as a fumigant was considerably extended during the year. The quarantine stations at the following places are now using this method: Baltimore, Md.; Boston, Mass.; Galveston, Tex.; Manila, P. I.; Mobile, Ala.; New York, N. Y.; Pensacola, Fla.; Port Townsend, Wash.; Seattle, Wash.; Panama City, Fla.; San Francisco, Calif.

During the year 1,471 vessels were fumigated by this method.

*Yellow fever.*—From July 1 to November 1, 1923, the modified quarantine against Mexican ports, instituted in May, 1923, was continued.

During the present close quarantine season the measures against yellow fever have been limited to the fumigation for the destruction of mosquitoes on board vessels from ports on the eastern coast of Mexico and the eastern coast of South America north of Victoria, Brazil, which have not lain at wharves or anchorages free from the presence of *Aedes ægypti* mosquitoes at the port of departure.



## VIOLATION OF QUARANTINE LAWS

During the fiscal year the department assessed fines aggregating \$1,725 for violations of the act of February 15, 1893, because of the failure of masters of vessels to present American consular bills of health.

SUMMARY OF TRANSACTIONS AT NATIONAL (CONTINENTAL AND INSULAR) QUARANTINE STATIONS FOR THE FISCAL YEAR ENDED JUNE 30, 1924

Total<sup>1</sup> inspections: Vessels, 22,357; crew, 1,237,479; passengers, 1,016,617. Total persons inspected, 2,254,096. Vessels passed on certificate of ship's medical officer, 498.

*Persons and vessels detained or treated—Those inspected only not included*

	Nature of infection							Total
	Yellow fever	Rodent plague	Human plague	Small-pox	Ty-phus	Chol-era	Lepro-sy	
Vessels from infected ports <sup>1</sup> .....	166	3,022	487	56	20	-----	4	3,755
Infected vessels <sup>2</sup> .....	-----	-----	-----	24	1	-----	5	30
Number of cases <sup>3</sup> .....	-----	-----	-----	29	1	-----	6	36
Number of crew detained.....	847	-----	-----	358	1	-----	-----	1,206
Number of passengers detained.....	42	-----	-----	1,419	463	-----	-----	1,924
Persons bathed and disinfected.....	-----	315	-----	102	783	-----	-----	1,200
Persons vaccinated.....	-----	-----	-----	4,775	-----	-----	-----	4,775
Laboratory examinations (persons) <sup>4</sup> .....	1	-----	-----	-----	160	-----	1	162
Vessels fumigated: <sup>5</sup>								
HCN.....	10	1,479	117	-----	1	-----	-----	1,607
SO <sub>2</sub> .....	8	2,032	2	5	-----	-----	1	2,048
CNCl.....	-----	1,470	-----	-----	-----	-----	1	1,471
HCN and SO <sub>2</sub> .....	22	69	-----	-----	-----	-----	-----	91
HCN and CNCl.....	-----	88	-----	-----	-----	-----	-----	88
SO <sub>2</sub> and CNCl.....	-----	2	-----	-----	-----	-----	-----	2
Formaldehyde.....	-----	-----	-----	2	-----	-----	-----	2
Formaldehyde and SO <sub>2</sub> .....	-----	-----	-----	1	-----	-----	-----	1

<sup>1</sup> That is, ports which have been designated as infected by circular letter, publication of cases in public health reports, etc.

<sup>2</sup> Vessels with cases on board on arrival or reported en route.

<sup>3</sup> Includes carriers.

<sup>4</sup> Includes microscopical examinations of blood, excreta, tissue, etc.

<sup>5</sup> Includes vessels fumigated after passing quarantine in accordance with provisional pratique. Periodic fumigations for destruction of rodents are listed in the "Rodent plague" column. Vessels fumigated are entered in the columns indicating the disease for which fumigated, as well as opposite the fumigating agent used.

Number of rats destroyed on ships, 27,395; rats examined, 21,108.

<sup>1</sup> An inclusive figure, regardless of treatment or report elsewhere.

## TRANSACTIONS AT CONTINENTAL QUARANTINE STATIONS

*Transactions at continental quarantine stations for the fiscal year ended  
June 30, 1924*

Station	Vessels in-spected	Vessels fumigated	Passengers and crews inspected	Station	Vessels in-spected	Vessels fumigated	Passengers and crews inspected
Alexandria.....	0	0	0	Mobile.....	372	94	9,337
Atchafalaya (Morgan City).....	0	0	0	Monterey.....			
Baltimore, Md.....	691	345	27,331	Newbern.....	0	0	0
Beaufort.....	2	0	872	New Orleans.....	2,051	538	91,023
Biscayne Bay.....	407	2	15,763	Newport.....	9	0	315
Boca Grande.....	35	1	1,118	New York.....	4,816	1,079	1,135,749
Boston.....	904	165	109,442	Ogdensburg (Chicago).....	7	0	
Brownsville <sup>1</sup> .....	0	0	2,793	Pascagoula.....	19	6	138
Brunswick.....	20	9	507	Pensacola.....	381	88	2,219
Cape Fear.....	50	21	1,486	Perth Amboy.....	33	11	937
Cedar Key.....	0	0	0	Port Angeles.....	43	2	476
Charleston.....	188	28	8,154	Port Aransas.....	5	0	46
Columbia River.....	291	173	11,784	Port San Luis (Port Harford).....	56	0	1,905
Coos Bay.....	39	32	1,299	Portland.....	125	23	20,849
Cumberland Sound.....	41	3	1,229	Port Townsend.....	433	86	50,411
Darien.....	0	0	0	Presidio <sup>1</sup> .....	0	0	555
Delaware Breakwater.....	8	0	180	Providence.....	104	9	17,623
Eagle Pass <sup>1</sup> .....	0	0	4,053	Rio Grande and Roma <sup>1</sup> .....	0	0	314
Eastport.....	368	0	32,169	Sabine.....	613	192	18,348
El Paso <sup>1</sup> .....	0	0	28,113	St. Andrew.....	32	21	548
Eureka.....	11	0	451	St. George Sound.....	14	0	138
Fort Bragg.....	1	0	39	St. Johns River.....	129	24	3,892
Fort Monroe.....	617	219	24,588	St. Joseph.....	14	0	109
Freeport.....	145	0	3,790	San Diego.....	1,078	1	11,557
Galveston.....	915	179	34,499	San Francisco.....	643	562	108,194
Georgetown.....	7	0	55	San Pedro.....	1,559	131	61,681
Gloucester.....	10	0	73	Santa Helena <sup>1</sup> .....	0	0	48
Gulf.....	63	15	1,352	Savannah.....	121	22	4,599
Hidalgo <sup>1</sup> .....	0	0	4,598	Seattle.....	0	178	0
Houquiam.....	70	70	2,776	South Bend.....	9	8	383
Ketchikan.....	49	0	9,472	Tampa Bay.....	373	57	8,131
Key West.....	271	17	32,736	Vineyard Haven.....	1	0	6
La Jitas <sup>1</sup> .....	0	0	32	Washington, N. C.....	0	0	0
Laredo <sup>1</sup> .....	0	0	39,654				
Marcus Hook (Philadelphia).....	1,066	485	44,193	Total.....	19,309	4,896	1,994,235

<sup>1</sup> Border stations. Figures do not include local travelers, who, however, were subjected to cursory inspection. Through travelers were given close examination.

## REPORTS FROM CONTINENTAL QUARANTINE STATIONS

*Baltimore (Md.) quarantine.*—Acting Asst. Surg. T. L. Richardson in charge. Post-office and telegraphic address, Curtis Bay, Baltimore, Md.

There were no quarantinable diseases discovered on incoming vessels. Fifty-eight cases of smallpox were treated during the year, however, 51 of which were received from the Baltimore City Health Department, 6 from Baltimore County, and 1 from Cecil County, Md.

The chief concern of this station is to prevent the introduction of bubonic plague. This is accomplished by fumigating vessels for rodents.

Formerly vessels were fumigated at this station by means of sulphur dioxide or hydrocyanic-acid gas. On October 25, 1923, the new method of fumigating with cyanogen chloride gas was introduced.

On the third vessel fumigated by cyanogen chloride gas a slight fire occurred, which was quickly extinguished. The only damage was that done to the tarpaulin covering the hatch. Upon investigation it was apparent that the ingredients had not been mixed in the proper proportions; i. e., the men assisting did not add the proper amount of water. This conclusion was corroborated by experiments which showed that if an excess of acid is used the chemical reaction will be accelerated and may cause a fire.

*Boston (Mass.) quarantine.*—Surg. George Parcher in charge. Post-office and telegraphic address, Gallops Island, Boston, Mass.

The quarantine station, consisting of an administration building, hospital, barracks, heating plant, delousing plant, laboratory, quarters for personnel, etc., is located at Gallops Island, 6 miles from Boston. Practically all vessels are boarded in President's Roads, about 1 mile west of the station.

Two steam tugs, the *Capt. Samuel C. Cardwell* and the *Lieut. Edgar F. Koehler*, were received at the station during the year and replaced the steam tug *Waterhouse* and the gasoline launch *Shearwater*.

In general, the buildings are in good condition, are well equipped, and are ready for immediate use at any time occasion demands. Considerable exterior painting and some minor repair work should be provided for at an early date for the preservation of the buildings. During the past year the wharf was replanked, a steam sterilizer was set up and placed in use, and the installation of a new underground telephone system, to connect with the city lines, was begun and will be completed soon. This underground system replaces the old overhead lines, which were a constant source of trouble in the winter months. The new attendants' quarters building was placed in use during the year, and the newly assigned nurses' quarters were adequately furnished. A considerable amount of material and equipment was received from surplus.

During the year the use of the cyanogen chloride gas mixture as a fumigant was begun at this station, and for several months a chemist and an assistant were assigned to duty here in connection with the use of this gas. The fumigation of ships is done either at the various piers at the city of Boston or at the quarantine anchorage.

But one vessel arrived with quarantinable or suspected quarantinable disease on board. On July 7, 1923, one case of typhus fever in a steerage passenger, three contacts, and the attendant for same, all of whom had been isolated on board, were removed from the steamship *Samaria* from Liverpool and Queenstown. No further cases developed among the contacts. Three cases of measles were cared for at this station for Marine Hospital No. 2.

When the services of the nurses are not required at the quarantine station they are employed at Marine Hospital No. 2.

The work of the laboratory in examining the rats recovered from fumigated vessels and in the mass inoculation of guinea pigs has been continued. No plague-infected rat was found. The flea count work on rats begun last year was discontinued in December.

#### *Summary of work of the rodent laboratory*

Number of rats from ships fumigated at Boston.....	299
Number of rats from ships fumigated at Portland, Me.....	12
Number of rats from ships fumigated at Providence, R. I.....	436
Number of rats from ships fumigated at Boston for flea count.....	839
Number of fleas on above rats from Boston.....	1, 623
Number of ships fumigated at Boston from which rats were received.....	20
Number of guinea pigs inoculated.....	127
Classification of rats examined:	
<i>Mus norvegicus</i> .....	1, 272
<i>Mus alexandrinus</i> .....	163
<i>Mus rattus</i> .....	151

*Columbia River (Oreg.) quarantine.*—Surg. H. M. Manning in charge. Post-office and telegraphic address, Astoria, Oreg.

During the fiscal year two vessels arrived at quarantine from ports in the Orient with smallpox on board.

On February 24, 1924, the British steamship *Benavon* arrived with two cases of smallpox. This vessel was remanded to the quarantine station, all on board were vaccinated, and the sick isolated in the hospital. The crew were bathed, their effects disinfected, and their quarters fumigated with formaldehyde.

The American steamship *Eastern Knight* arrived on March 8, 1924, with one case of smallpox. Treatment was the same as in the case of the steamship *Benavon*. In both cases those persons having successful vaccinations or showing immune reactions were released with the vessels a few days after entering quarantine. The others were held to complete the 14-day detention period or until they showed evidence of successful vaccination.

*Delaware Bay and River quarantine.*—Surg. Carroll Fox in charge. Post-office and telegraphic address, 410 Chestnut Street, Philadelphia, Pa.

The Delaware Bay and River quarantine system comprises the quarantine boarding station at Marcus Hook, the fumigation activities at Philadelphia, and the detention stations at Reedy Island, Del., and at Lewes, Del. The latter are maintained as adjuncts to the boarding station at Marcus Hook for the purpose of providing facilities for the detention and treatment of the passengers and crews of infected vessels.

Of the vessels fumigated at Philadelphia, 133, or 27.4 per cent, were remanded from other quarantine stations, and 90 vessels were remanded from Philadelphia to other quarantine stations.

As heretofore, practically all fumigation work has been conducted at the wharves in Philadelphia, Pa., Camden, Gloucester, Paulsboro, N. J., Claymont, Del., or at anchorage. Occasionally vessels are fumigated at the Marcus Hook quarantine station, approximately 16 miles below Philadelphia, but this is a departure from the rule. Because of the extensive water frontage at this port, considerable time is expended in connection with the fumigation of vessels, with due consideration to available facilities.

Three thousand two hundred and forty-seven dead rats were found after fumigation, although it was not always practicable to search the vessels.

*Galveston (Tex.) quarantine.*—Senior Surg. G. M. Guiteras in charge.

The steadily growing ports of Galveston, Houston, and Texas City are served by the Galveston quarantine station, located on the northern extremity of Pelican Spit, on the western side of Galveston Channel. The quarantine anchorage is in Bolivar Roads, approximately  $1\frac{1}{2}$  miles distant from the station. All vessels from foreign ports or infected domestic ports anchor here and are boarded and inspected by the boarding officer. Coastwise vessels, not requiring inspection, report by megaphone, as they pass the station, the port of departure, character of sanitary statement, and condition of crew and passengers. On arriving at the pier the master transmits by mail a form giving all necessary data relative to the sanitary condition of his ship and its personnel. Such ships are classed as spoken and passed.

No vessel was disinfected for the destruction of mosquitoes on account of yellow fever. This was due to the fact that all vessels arriving here from possibly yellow fever infected ports were fumigated at the port of departure prior to sailing or had complied with the regulations permitting entry without fumigation.

Throughout the period covered by this report the cyanogen chloride method of fumigation has been used. The sulphur dioxide method or a combination of the two has been used when exigency demanded or when better results could be obtained thereby.

In connection with the above it is necessary to report that it has been impracticable during the fiscal year to comply with the provision of bureau circular letter dated January 16, 1923 (cyanogen chloride gas mixture), on account of the insufficient personnel at this station. The circular letter referred to prescribes that a fumigating crew should consist of a chief fumigator and seven assistant fumigators, or eight in all. The maximum number in a fumigating crew at this station has rarely exceeded five, including the chief fumigator.

The general condition of the station is good. Among the more important improvements made during the year the following may be mentioned:

- (1) A new flag mast erected at a cost of \$662.
- (2) The extension of the riprap protection along the western side of the reservation at a cost of \$9,125.
- (3) Repairs to the present wharf dolphins and the addition of two new clusters, increasing the landing space for ships by 100 feet, at a cost of \$4,375. This is important for the reason that it will permit large vessels to tie up to the pier, which heretofore has been impossible owing to the limited extent of space for lying-to against the wharf frontage.
- (4) The equipment for emergency fire protection has been much increased by the putting in commission of four two-wheel hand-drawn 33-gallon chemical fire extinguishers. They have been tried out with excellent results.

Preliminary steps have been taken, under authority of the department, to install a hot-water heating system in the principal buildings on the station and to supply a new fire engine. When the above equipment is put in operation, the buildings at this station will be well heated and amply protected from fire.

*Key West (Fla.) quarantine.*—Acting Asst. Surg. J. Y. Porter, jr., in charge.

The equipment at this station consists of the boarding launch *Gannet* and the floating hospital *Wistaria*. The former was remodeled during the year and is now in excellent condition. The floating hospital *Wistaria*, which went ashore in the harbor during the hurricane of 1919, is almost a total wreck. A severe storm would probably destroy her entirely. It was recommended last year that a site on one of the keys adjacent to Key West be acquired, where a quarantine detention station could be erected on piling in a location safe from hurricanes.

*Lake Sabine District quarantine.*—Surg. T. J. Liddell in charge. Post-office and telegraphic address, Port Arthur, Tex.

The Lake Sabine quarantine district includes the ports of Beaumont, Port Arthur, Orange, Port Neches, Sabine, Sabine Pass, and

other small ports on the Sabine Lake, Sabine River, and Neches River. The Lake Sabine district quarantine station, the Sabine quarantine station, and relief station No. 309 are under the same medical officer, which facilitates the service activities in this vicinity.

All ships from foreign ports entering the district have been required to fend off from the wharves or docks not less than 4 feet, to be provided with rat guards of sheet metal of approved design and not less than 3 feet in diameter on all lines leading ashore, to have their gangways and ladders raised at night unless they are lighted and watched, and to be fumigated every six months at the Sabine station. Vessels lying alongside the piers in this district are inspected night and day.

During the fiscal year, 1,986 American vessels and 310 foreign vessels arrived in this district. Of the 696 port sanitary statements issued, 678 showed compliance and 18 noncompliance with the regulations. In checking the enforcement of these regulations, a total of 7,991 inspections (day and night) were made. The number of inspections made were as follows: Beaumont, 2,306; Port Arthur, 5,551; Orange, 97; Port Neches, 37; total, 7,991.

The number of port sanitary statements issued were as follows:

(1) Showing compliance with the quarantine regulations—Port Arthur, 472; Beaumont, 198; Sabine, 26; total, 696.

(2) Showing noncompliance—Port Arthur, 9; Beaumont, 9; Sabine, 0; total, 18.

*Marcus Hook (Pa.) quarantine.*—Surg. F. A. Carmelia in charge.

Only one vessel arrived at quarantine with quarantinable disease on board during the year. This was a fishing vessel, the American steamer *Mary B. Garner*, carrying a crew of 42 persons, 1 of whom had a fully developed case of smallpox, and 20 of whom bore no evidence of previous vaccination. The vessel was detained for appropriate treatment and the unvaccinated personnel were removed and detained for observation. No additional cases developed, probably due to unusually early isolation of the case on board by the captain of the vessel and early vaccination of the unvaccinated members of the crew.

Because of the fact that few regular line vessels call direct at this port, the percentage of arriving vessels requiring fumigation is relatively high. Thirty-three and five-tenths per cent of arriving vessels were granted provisional pratique and fumigation was ordered following discharge of cargo in the port. Fifty-seven per cent of the vessels granted provisional pratique were from ports requiring fumigation upon arrival, and 43 per cent were vessels requiring periodic fumigation every six months.

Eighty per cent of the vessels entering the port under provisional pratique completely discharged their cargoes in the port and were fumigated, while 20 per cent actually completed discharge of cargo at some other port to which they were remanded for final fumigation. In addition, there were 205 vessels which had made some other port the first port of call and which completed discharge of cargo at this port and were then subjected to fumigation, increasing the number of fumigations done at this port from 280 to 485.

*Mobile (Ala.) quarantine.*—Surg. Carl Michel in charge.

Quarantine functions of this port were greatly improved by the transfer of its activities from Fort Morgan to Mobile. This transfer

was effected in November, 1923, and an office was established on the water front. The station at Fort Morgan was placed in the hands of caretakers and held in readiness for opening in the event of the arrival of quarantinable diseases in the port.

All quarantine activities are now transacted at Mobile, and ships are fumigated alongside the piers according to the methods of procedure established in the larger ports of the United States. Vessels are boarded and fumigated more promptly than was possible at Fort Morgan, so that each vessel entering the port saves from 4 to 12 hours in time.

Port sanitary statements, a source of considerable information as to the shipping entering and leaving the port of Mobile, are now being issued by the quarantine office.

The tug *Von Ezdorf* was transferred to this station during the year, and has proved to be a valuable addition, as a suitable boarding boat had been urgently needed for years. With the tug, personnel and supplies can be rapidly transferred to Fort Morgan, and the station there can function at once, if required to do so.

Weekly inspection trips are made to Fort Morgan, and, at the present time, the tug is the only means of transportation. On these trips the tug carries supplies for the Army caretaker in charge of the fort; for the Lighthouse Service, to supply the lighthouse keepers in the vicinity of the fort; for the Tropical Radio Co., supplying the radio operator at the fort; and for the Alabama Pilots Association, supplying the pilot boats.

The station at Fort Morgan is in very poor condition, because of structural defects; and to condition it would cost a considerable sum. It is hoped that a new station will be built on Sand Island during the coming year.

*New Orleans (La.) quarantine.*—Surg. C. L. Williams in charge. Post-office address, Quarantine, La.

In addition to the medical officer in charge, there are 3 medical officers, 1 administrative assistant, and 37 employees assigned to duty at this station. Of these, 1 medical officer and 10 employees are engaged in the fumigation of vessels at the wharves at New Orleans.

The most important diseases to be guarded against at this station are plague and yellow fever. In the past, New Orleans has suffered severely from both of these diseases. Plague is present at many of the ports of South America, as well as in the two largest Mexican ports. While the prevalence of yellow fever has greatly diminished of late years, it is still known to be present in certain parts of South America.

In July, August, September, and October of 1923 active quarantine to prevent the introduction of yellow fever from Mexican and South American ports was enforced. Restrictions for the summer of 1924 have been greatly modified on advice from the bureau that Mexican and South American ports were believed to be free from yellow fever.

The boarding and inspection of vessels is performed at the quarantine station located on the Mississippi River 90 miles below New Orleans, La. When boarding vessels, the medical officers are accompanied by two immigration inspectors, who are domiciled at the station. After the quarantine inspection has been completed, the alien passengers and the alien members of the crew, designated by

the immigration officers, are further examined and diseased conditions and defects certified.

Passengers or members of crews suspected of having quarantinable disease are removed to the station hospital for observation and, if deemed advisable, the vessel is detained. Under certain circumstances the sick are removed and the vessel is permitted to proceed. This is regarded as safe, for the reason that, in the 8 to 10 hours required for a ship to reach New Orleans after leaving quarantine, a reasonably accurate diagnosis can be made. If a diagnosis of a quarantinable disease is made, the ship can be stopped before entering the port and returned to quarantine. During the year it has not been necessary to recall a single ship granted this privilege.

Every possible effort is made to expedite the passage of vessels. To this end, direct relations are maintained with many shipping companies and agents in New Orleans whereby special information is obtained and frequently special arrangements are made some time in advance of the arrival of a vessel at quarantine.

Fruit ships arriving at quarantine between sunset and midnight are inspected at the station pier, where a well-lighted room for the examination and inspection of the passengers and crews is provided.

All fumigation for the destruction of mosquitoes and, on request for other purposes, is done at the quarantine station. The major proportion of fumigation, however, is performed at New Orleans. The personnel of the fumigation division consists of a medical officer, a clerk, a chief fumigator, and a fumigation squad of eight men. The fumigators have all had exceptional training in this work and are highly efficient. All fumigation of ships is done with cyanide gas. This squad can fumigate and has on several occasions fumigated as many as five ships in a day. The squad is supplied with two trucks and the medical officer with automobile transportation.

In the climate of New Orleans ships are readily cleared of cyanide gas and only in exceptional cases, in deep forepeaks and storerooms entered only through a hatch, is the use of fans required. In these instances the practically universal equipment of ships with electricity has permitted the use of electric fans. The fumigating squad is equipped with electric fans and with a variety of plug connections to fit all known types.

Rigid care and safety rules are enforced during all ship fumigation so as to protect the fumigation squad and members of the ship's crew.

All rats found after fumigation are sent to the laboratory for examination.

During the period from September 23, 1923, to April 2, 1924, pending the completion of additions to the leprosarium at Carville, La., a number of lepers were temporarily housed at the quarantine station. The maximum number at the station at one time was 14. Two of the lepers died during this period and were buried in the station cemetery.

Plumbing alterations to make the buildings allotted these patients suitable were very extensive, one item alone being the running of a 2,000-foot pipe line. Some other items were the installation of stoves and incinerators, and the building of an outside laundry, and a thousand-foot board walk.

The rapidity with which this work was completed speaks well for the efficiency of the station force.



## GENERAL

The year was marked by a serious accident when a truck attached to the fumigation division carrying sulphuric acid turned over and spilled acid over Acting Asst. Surg. R. E. Bodet and several fumigators, injuring them seriously. As a result of this accident, special precautions have been instituted to prevent a recurrence.

On April 23, 1924, a Public Health Service nurse was, for the first time, assigned to duty at quarantine. This filled a much-needed want of the station, inasmuch as only the sick are removed from ships, and particularly as it is often necessary to detain female passengers.

The station hospital has been improved, and it is hoped that additional equipment to provide more suitable quarters for nurses assigned to this station will be received.

Because of the amount of work carried on at this station, a full-time clerk is badly needed.

Two trucks for the fumigating division were obtained from Army surplus during the year. Because of a shortage of funds, a considerable amount of much-needed equipment to improve the station could not be secured. It will be absolutely necessary, within the next year or so, to make extensive repairs to the station boilers, the wharf, and several of the buildings.

*New York (N. Y.) quarantine.*—Surg. S. B. Grubbs in charge. Post office and telegraphic address, Rosebank, N. Y.

The following constitute the New York quarantine station:

(1) Headquarters, Rosebank, Staten Island, on the west shore of the Narrows.

(2) Hoffman and Swinburne Islands, located in lower New York Bay, 3 miles south of Rosebank.

(3) A subboarding station at City Island, on Long Island Sound.

(4) An office, customhouse, New York, for the issuance of port sanitary statements.

Headquarters, at Rosebank, comprise the general offices, laboratory, boarding office, supply depot, garages and automobile repair shop, officers' quarters, floating property, and wharves.

Hoffman and Swinburne Islands are detention stations. The Hoffman division is in active use and includes the hospital, the medical officers', nurses', and employees' quarters, and the necessary mechanical plants. Water is supplied through a main, and electric and telephone service are supplied by cable from the mainland. Swinburne Island is inactive, under the supervision of caretakers. In emergency, its barracks and hospital, after reasonable preparation, could be made available for use.

The City Island subboarding station provides quarantine inspection service for vessels entering through Long Island Sound, principally from Canadian ports. It is supervised by a part-time medical officer.

The New York office is conducted by a service representative, who issues sanitary statements for departing vessels.

*Transportation.*—The station operates and maintains four trucks and two ambulances for the transfer of fumigators and fumigating equipment to the wharves of New York, Brooklyn, New Jersey, and Staten Island.

The floating property consists of three steam tugs, the *Pyxie*, *Moreton*, and *Kinyoun*; a 64-foot launch, the *Bratton*, operated by a 100 horsepower semi-Diesel engine; and a small 40-foot gasoline launch, the *Q-1*.

Two tugs in active operation and one for relief are used for boarding purposes and for the transfer of sick or detained crew or passengers to Hoffman Island. The *Bratton* is in daily operation transporting fumigating material and men to vessels in the stream, or at wharves inaccessible to or not conveniently reached by trucks. When not so occupied, the *Bratton* relieves the *Q-1* in the transportation of employees and supplies to Hoffman and Swinburne Islands, and, in emergency, performs auxiliary duties in connection with boarding.

The launch *Q-1* runs upon regular daily schedule between Rosebank and Hoffman and Swinburne Islands, transporting employees and supplies, and is immediately available for special trips during the day and night whenever emergency may require.

By reason of a minimum personnel, this floating property is operated and maintained with admirable economy, and its flexibility permits quick transfer in emergency from one duty to another.

#### *Station personnel*

Classification	On duty June 30, 1923	On duty June 30, 1924
Commissioned officers.....	6	5
Acting assistant surgeons.....	10	10
Pharmacists.....	2	2
Consulting bacteriologists.....	1	1
Clerks.....	10	9
Nurses.....	4	3
Pilots.....	5	3
Marine engineers.....	5	4
Other employees.....	157	137
Total.....	200	174

*Station operations.*—The work of the station is performed under eight divisions, as follows: (1) Boarding; (2) laboratory (closely affiliated with the boarding division); (3) hospital, detention, and delousing; (4) fumigation; (5) personnel and accounts; (6) property; (7) buildings and grounds; (8) mechanical and floating property board.

#### BOARDING

The duties of this division include the following: (1) The inspection of vessels, passengers, and crews from foreign ports for the detection and exclusion of quarantinable diseases and disease-transmitting vermin and insects; (2) the certification or enforcement of disinfection of certain articles of freight; (3) the issuance of fumigation orders under provisional pratique to masters of vessels requiring fumigation for the destruction of rodents; (4) the inspection of crews of freight vessels in conformity with the United States immigration laws and regulations; (5) the instruction of service officers in the technical and practical application of quarantine laws and regulations on arriving vessels; (6) the explanation and demonstration of

quarantine practices to foreign and domestic health representatives officially visiting the station; and (7) the instruction, supervision, and direction of inspectors (male and female) engaged in inspection for vermin on vessels and clerical office work ashore.

The personnel consists of a medical officer in charge of the division, assisted by six additional medical officers, two of whom are detailed from Ellis Island for immigration purposes and two male and two female inspectors.

The boarding of vessels in quarantine begins at the nearest quarter hour to actual sunrise, but not earlier than 5 a. m. for cargo vessels and 6 a. m. for passenger vessels. Boarding ends at the even quarter hour following actual sunset, but not earlier than 6 p. m. Vessels arriving between official sunset and 8 p. m. are boarded on request, provided the request is received before 5 p. m. and satisfactory evidence is furnished that the vessel can and will arrive in quarantine within the time specified.

Every effort, not inconsistent with thorough examination and investigation, is made to expedite the quarantine inspection. Delays at quarantines are due, most commonly, to delayed or incomplete muster of passengers or crew through ignorance, neglect, or disregard of requirements by ships' officers.

Through personal explanation on board and through mimeographed instructions relating to the quarantine function, effort is made to stimulate interest in a prompt and careful muster just before arrival in port. These measures have resulted in closer cooperation and steady improvement, and on many vessels ship's papers are in perfect order and the muster is complete upon arrival.

Close cooperation has been maintained and information freely exchanged between this station and service officers in Europe. In several instances prompt information from our officers abroad of possible exposure of persons embarking for this port has enabled this station to take special precautions in the handling of such persons with a minimum delay to commerce. Weekly reports, giving the number and origin of vermin-infested persons arriving in quarantine, are sent to the Paris office. It is noteworthy that the necessity for such reports has steadily decreased during the present fiscal year.

*Typhus fever.*—No cases of typhus fever were detected on incoming vessels during the year, again emphasizing the complete success of procedures in foreign ports to exclude the disease from persons embarking for the United States. Nevertheless there has been no relaxation in effort to detect louse-infested persons on incoming ships. To this end an intensive examination by trained inspectors is made of selected groups (100 men and 100 women on each large vessel) of all third-class passengers from Europe. If more than four persons, (i. e., 2 per cent) are found infested, the entire third class is examined intensively. All infested persons, with their families, are removed for delousing.

*Smallpox.*—Three cases of smallpox were quarantined during the fiscal year. Two presented typical symptoms on arrival. A third case, closely associated on board with one of the above cases, presented no symptoms of illness on arrival other than fever. This case became clinically recognizable as smallpox the day following removal to the

detention hospital at Hoffman Island, presenting throughout the attack a classical picture of discrete variola vera.

All persons on arriving vessels, whether passengers or crew, are vaccinated if there is a history of definite exposure to smallpox. The period of detention and the time of release from quarantine depend upon the individual results of this vaccination. Persons definitely immune to smallpox show a typical, more or less intense, immune reaction within from 12 to 24 hours, and upon its appearance are released. Persons in whom no reaction presents and whose vaccination later results in a vaccinoid or take are held to complete a period of 10 days after the last contact in order to be certain that variola does not develop simultaneously with vaccinia.

From past experiences there seems to be no doubt that smallpox can develop after the last exposure, four cases having developed at this station on the fifteenth, seventeenth, twentieth, and twenty-first day, respectively. To provide and protect against this possibility, a modified quarantine has been instituted against ports where smallpox is epidemic. All persons on arrival from such ports, irrespective of the time of departure, have been inspected for evidence of satisfactory vaccination. The unvaccinated and those with but little evidence of successful vaccination have been vaccinated and held until reactions appeared. In the case of passenger vessels carrying doctors some leniency was permitted, and if 21 days had elapsed these measures were not enforced.

During the fiscal year many persons have been vaccinated in accordance with a standardized technique and were issued certificates in the form of cards, on which is stated the name, age, height, and sex over the signature of the individual, and on which, in addition, is stated the nature of the vaccination reaction over the signature of the medical officer in charge after check by two service officers who have personally inspected the results. A considerable percentage of the crews of certain lines have been rendered immune to smallpox in this manner, and, having vaccination certificates, are exempt from smallpox quarantine at New York.

Customs and immigration officers and local pilots have been certified in this manner and cards for them issued. This has permitted their release when smallpox has been detected on vessels they have boarded.

It is hoped that official certification can be extended to include the operating personnel of all lines regularly entering New York, and agents and masters are encouraged to see that their crews are provided with these official certificates and thus remove the necessity for quarantine following exposure to smallpox.

If notice of the appearance of smallpox on board is received sufficiently in advance of the arrival of a vessel, the ship's doctor is requested, by wireless, to vaccinate all exposed persons 36 hours prior to arrival in port. Since the necessary interval for the development of the immunity reaction will have elapsed upon arrival at quarantine, those persons found to be immune may be released immediately.

*Yellow fever.*—One case presenting suspicious symptoms of yellow fever arrived on the steamship *General W. C. Gorgas* on September 10, 1923. The patient was promptly removed at quarantine and transferred to the Hoffman Island hospital. All personnel on board were carefully examined, and the vessel was inspected for mosquitoes and

fumigated. The case was mild, ran an uneventful course, recovered, and was discharged on September 17, 1923.

No cases of cholera, plague, leprosy, or anthrax were detected during the fiscal year.

Cases of communicable disease, such as varicella, measles, diphtheria, parotitis, typhoid fever, scarlet fever, pertussis, etc., which are not subject to quarantine detention, are reported to the department of health of New York City immediately by telephone.

The ship's surgeon or, in his absence, the master is directed to hold these cases and their contacts aboard until released by a representative of the city department of health.

If it can not be determined on board after consultation that a case is nonquarantinable, the sick person is removed to the detention hospital at Hoffman Island for further clinical and laboratory study and treatment.

When seamen employed upon vessels of the United States are found ill of quarantinable disease on arriving vessels, they are removed to Hoffman Island and, through a special arrangement with the United States marine hospital at Stapleton, are carried as patients of that institution without cost to the steamship companies. Because of the proximity of this marine hospital to the quarantine station, seamen seriously ill with nonquarantinable disease and in urgent need of surgical or medical treatment on arrival at quarantine are immediately transferred to this hospital, thus avoiding the delay which would result if they remained aboard until the vessel came alongside the pier.

#### LABORATORY DIVISION

One medical officer, with one assistant, operates the station laboratory, alternating with the chief of the boarding division for consultation and laboratory duty on vessels. The laboratory is also fortunate in having on call for consultation the chief of the research laboratory, New York City Health Department, Dr. William H. Park, who visits the laboratory at stated intervals for conference on problems relating to quarantinable diseases.

The medical officer in charge of the laboratory either performs or supervises the performance of all vaccinations done at the station. He also inspects and records the results of these vaccinations.

All rats recovered from vessels after fumigation or by trapping are delivered to the laboratory and there dissected and examined for evidences of plague infection. Smears from the liver, spleen, and suspicious looking glands are examined microscopically. Guinea pigs are inoculated with an emulsion from the organs of all rats—1 pig to 10 rats.

Studies in the classification of fleas for the purpose of determining the species infesting rats arriving in this port have been pursued.

Whenever routine work has permitted, studies of the gaseous fumigants used for the destruction of vermin on vessels have been undertaken. They include the following:

- (1) Comparison of the rapidity of reaction and generation of the cyanogen chloride gas mixture using sea and fresh water.

- (2) Study of the effects of varying temperatures on the rapidity of reaction and gas generation in the case of the cyanogen chloride mixture.

(3) Comparison of the toxicity for rats of sulphur dioxide, hydrocyanic acid, and cyanogen chloride gases.

(4) Study of the relative effects of these toxic gases on rats, following varied periods of time of exposure, following varied forms of artificial protection from the full effects of the gases during exposure, and following varied location of the rats in the room during exposure, especially as regards elevation.

(5) Comparison of the toxic effect of cyanogen chloride gas generated from varied proportions of the chemicals employed.

In order to make these experiments comparable with actual working conditions on vessels fumigated in the routine manner, these studies have been conducted aboard the tugs, using various compartments which have provided a cubic capacity of from 400 to 800 feet. In addition to the above, the laboratory has been engaged in the study of miscellaneous subjects, such as the technique of the Weil-Felix reaction and the efficacy of naphthaline in oil as a delousing agent, and has instructed in routine laboratory procedure the medical officers recently attached to the station.

*Laboratory division transactions*

Rats dissected and appearance noted:

Mus rattus.....	8, 208
Mus alexandrinus.....	5, 065
Mus norvegicus.....	656
Total.....	13, 929

Rats examined by inoculation test.....	13, 929
Smears from rats examined microscopically.....	7, 213
Rats suspected of being plague infected.....	0
Rats proved plague infected.....	0
Weil-Felix reactions performed (positive).....	0
Weil-Felix reactions performed (negative).....	160
Smallpox vaccinations performed by laboratory officers.....	331
Smallpox vaccinations inspected for reaction and cards issued.....	337
Blood cultures made.....	4
Blood smears examined.....	27
Specimen of urine examined for clinical diagnosis.....	149
Specimen of urine examined for typhoid bacilli.....	0
Stools examined for typhoid bacilli.....	44
Tests for Widal reactions.....	23
Throat and nose cultures for diphtheria bacilli.....	14
Urethral smears examined.....	3
Feces examined for parasites.....	1
Sputum examined for tuberculosis.....	19
Triple typhoid vaccinations administered.....	2
Tetanus antitoxin administered.....	1
Vessels boarded by laboratory officers.....	238

HOSPITAL, DETENTION, AND DELOUSING

This division, located on Hoffman Island, consists of one medical officer in supervisory charge, three nurses, and engineers, foremen, and attendants, employed as follows: Engineers department, 7; hospital, 12; dietetics and subsistence, 15; delousing and fumigating, 5; janitors and sanitary squad, 22; clerical, 2; laundry, 5; carpenters, 2; Swinburne Island caretakers, 2; total personnel, 72.

The facilities include a contagious hospital, capacity 30 beds; two modern brick dormitories, capacity 1,440 bunks; a modern brick

kitchen building provided with a subsistence storeroom, bakery, refrigerator rooms, and a modern, electrically operated ice plant. The building communicates with a dining pavilion and is equipped to provide food for 3,000 persons daily.

Additional brick dormitories, less modern in character and formerly used by the State of New York, are available for the care of 75 hospital patients and 1,120 persons detained for observation. The total available capacity is 2,635 persons. During the fiscal year no emergency has occurred to tax these facilities, and, under ordinary routine, persons in the hospital and detention barracks, including the operating personnel, for reasons of economy, have been furnished meals from a smaller kitchen and dining room.

*Delousing.*—Vermin-infested passengers discovered during quarantine inspection are immediately removed to Hoffman Island. When few in number (under 50), they are, for convenience and expedition, transported by station tugs. When in larger numbers the representatives of the vessel are required to furnish the necessary transportation and, in addition, to detail a member from the steward's department for each 50 persons detained, to accompany them and assist in their disposition. On arrival at Hoffman Island wharf their number is noted and all of their hand baggage is checked and transferred to the fumigating chambers for exposure to the vacuum cyanide process for the destruction of any contained vermin. The baggage is not opened and the exposure is completed in less than one and one-half hours. The infested persons, separated according to sex, are next conducted to the delousing chambers, where each person is supplied with a rubber waterproof bag for valuables, and two linen mesh bags, one for clothing that might be injured by steam and the second for all other clothing. All wearing apparel is then removed and placed in the proper bags. En route to the baths, these bags are passed through a chute into a fumigation room, where they are exposed either to steam or to the vacuum cyanide process. In the baths, infested persons are thoroughly sprayed with a gasoline-soap emulsion under pressure, which is then removed under showers, and "chemo," a volatile oil preparation, is applied to the head and other hairy portions of the body by spraying. This prevents the hatching of any ova adhering to the hair. The deloused persons then pass into the dressing rooms, where they put on their clothing returned from the fumigation chambers, and are then ready for release.

When the station employees are not engaged in caring for persons in detention, they are occupied in the repair and upkeep of equipment and buildings. They are thus constantly occupied, and perform a large amount of work which otherwise would have to be done under contract at a much greater cost.

*Hospital transactions*

Disease	Number of cases	Recovered	Improved	Unimproved	Died
Abcess.....	1	1	0	0	0
Adenitis.....	2	1	1	0	0
Arthritis.....	1	1	0	0	0
Bronchitis.....	2	2	0	0	0
Cellulitis.....	1	1	0	0	0
Chicken pox.....	35	35	0	0	0
Cystitis.....	1	0	1	0	0
Dermatitis.....	1	1	0	0	0
Diphtheria.....	2	2	0	0	0
Erythema.....	2	1	1	0	0
Erysipelas.....	3	3	0	0	0
Fever, cause undetermined.....	37	37	0	0	0
Gastroenteritis.....	5	5	0	0	0
Impetigo.....	1	1	0	0	0
Influenza.....	2	2	0	0	0
Malaria.....	1	1	0	0	0
Measles.....	13	13	0	0	0
No disease.....	2	2	0	0	0
Nephritis.....	1	0	0	1	0
Paratyphoid fever.....	2	2	0	0	0
Pityriasis.....	1	1	0	0	0
Pleurisy.....	3	3	0	0	0
Pneumonia, lobar.....	2	2	0	0	1
Scarlet fever.....	5	5	0	0	0
Smallpox.....	3	3	0	0	0
Sprain.....	1	1	0	0	0
Tonsillitis.....	1	1	0	0	0
Tuberculosis.....	3	0	2	1	0
Typhoid fever.....	7	6	0	1	0
Vaccinia.....	1	1	0	0	0
Ulcer.....	1	0	0	1	0
Total.....	144	134	5	4	1

Total number of relief days..... 1,560

*Detention and delousing transactions*

Passengers detained.....	889
Crew detained.....	251
Passengers deloused.....	459
Persons vaccinated.....	360
Pieces of baggage fumigated.....	437

## FUMIGATION DIVISION

The fumigation personnel consists of a medical officer in general charge, four medical officers in direct personal charge of fumigation on board vessels, one office clerk, one messenger, one foreman and two trapping crews of three men each, and three fumigating crews, each consisting of a foreman and two first-class and two second-class fumigators; total employed, 29.

Vessels are fumigated at their piers, or in the stream adjoining, in New York, Brooklyn, New Jersey, and Staten Island. Equipment and supplies are stored at the station, whence they are transported by truck or by launch to the vessels.

Hydrocyanic acid and cyanogen chloride gases have been used exclusively. The use of cyanogen chloride, because of its greater safety and slightly greater toxic effects on rats, has been extended to all vessels fumigated, except oil tankers. These vessels, because of greater fire risk when using cyanogen chloride, have been fumigated with hydrocyanic-acid gas.

During the fiscal year this division fumigated 1,011 vessels and supervised the fumigation of 68, totaling more than 3,125,000 net tons. Based on cubic capacity, it is estimated that more than 500,000,000 cubic feet of ship space were exposed to the effects of hydrocyanic acid or cyanogen chloride gas. The total number of



rats obtained was 10,624, an average of 10.2 rats per vessel, on the basis of 10,379 rats obtained from 1,011 vessels fumigated by the division. The average number of rats per vessel during 1922 was 4.8; during 1923, 8.

*Trapping.*—During the early part of the fiscal year three trappers were employed for the purpose of trapping on vessels in order to compare the value of trapping with fumigation. Later, when it was found, because of congestion of work, that many vessels could not be submitted to the fumigation process, trapping was extended to include such vessels. The results were very encouraging, and the trapping force was gradually increased. At the end of the fiscal year it consisted of two crews of three men each, supervised by one foreman. Two light trucks provide transportation, which has enabled this force to trap an average of three and one-half ships per working day. "Official" snap traps, baited with bacon, are employed at the rate of approximately 50 traps to each 1,000 net ship tons. A few cage traps have been used to obtain live rats in order to supply the station laboratory with rat fleas for the identification of infesting species. Traps are placed throughout the vessel and left overnight. Occasionally when the stay in port permits, a vessel has been trapped on several successive days. When time and circumstances have permitted, fumigated vessels have been trapped also, either before or after fumigation.

While the data are insufficient to warrant definite conclusions, the results of trapping have proved interesting, as the following comparisons will show:

*Comparison of trapping and fumigation*

	Number of vessels		Number of rats obtained		Average number of rats per vessel
Fumigated.....	1, 101		10, 379		10. 2
Trapped only.....	95		1, 467		15. 4

Number of vessels	Trapped before fumigation		Fumigated after trapping	
	Number of rats trapped	Average number rats trapped	Number of rats	Average number of rats per vessel
95	1, 230	12. 9	1, 380	14. 5

Number of vessels	Fumigated before trapping		Trapped after fumigation	
	Number of rats	Average per vessel	Number of rats trapped	Average number of rats per vessel
110	1, 601	14. 6	742	6. 7

Total results from fumigation: Vessels, 1,011; rats, 10,379; average number of rats per ship, 10.2.

Total results from trapping: Vessels, 300; rats, 3,439; average number of rats per ship, 11.4.

Among 5,556 rats recovered from fumigation, 3,635, or 65.4 per cent, were obtained from the holds; 1,921, or 34.6, per cent, were obtained from the superstructures. This relative distribution of rats on vessels is similar to that of previous experience at this and other stations.

Among 2,635 rats trapped, 1,794, or 68.1 per cent, were trapped in holds, and 841, or 31.9 per cent, were trapped in the superstructures.

All rats obtained by fumigation or trapping were transported to the station laboratory, where they were identified according to species and examined for evidence of plague.

*Comparison of the efficiency of gases*

Name of gas	Number of vessels	Number of rats obtained	Average number of rats per vessel
Hydrocyanic acid.....	122	1,343	11.0
Cyanogen chloride.....	150	2,008	13.38

*Safety measures employed.*—A medical officer conducts and directly supervises all fumigations. With the exception of certain designated members of the crew required to assist in the process, all members of the ship's personnel are excluded from the vessel during fumigation and are not permitted to return aboard until the vessel has been declared safe by the medical officer. Fumigators are required to wear gas masks and to refrain from entering compartments until a reasonable period of time for ventilation has elapsed. In cases of holds the period has been fixed at one hour after opening, and then only after testing with white rats. The men who pour the acid are furnished acid-proof gloves and goggles, and all fumigators are provided with focusing flashlights. Aerothrust fans are employed to assist in the ventilation of compartments whenever natural ventilation is inadequate. No serious accident occurred during the fiscal year.

#### GENERAL

Excellent and agreeable cooperation has been maintained with the district coordinator, the supervising chief engineer, and various officers of the Army, Navy, Coast Guard, Customs, and Immigration Service.

Through a mutually agreeable arrangement with the Coast Guard and the customs division, customs boarding officers now share quarantine transportation facilities and board incoming vessels on service tugs as do immigration officials. This arrangement has been under trial for practically one month and appears to be feasible and practicable. If found mutually satisfactory, this will permit the permanent withdrawal of one Coast Guard tug from customs boarding duty.

#### RECOMMENDATIONS

The north dock at Rosebank should be replaced. The present dock is worn out and unsafe and is rapidly disintegrating. The party-line fence on the north, separating the station and the St. John's Church property, should be renewed. The defective south-line fence near the water front should be replaced in order to prevent trespass and depredations. The dilapidated buildings now used for

the storage of dangerous chemicals and for garage and shop purposes should be reconstructed, using substantial fireproof materials. These repairs have been previously recommended. Delay makes the necessity more apparent. In the buildings mentioned, automotive equipment and chemicals are exposed to the action of the elements.

At Hoffman Island numerous barrack buildings require renewal of cornices and the pointing up of brickwork, essential to proper preservation. The coal pier is supported on defective underpinning. This should be renewed and, in the interest of economy, this pier should be extended to permit greater facility in the handling of coal. These and other important repairs on the island have been investigated by the office of the supervising chief engineer.

*Ogdensburg (N. Y.) quarantine.*—Acting Asst. Surg. R. L. Stacy in charge.

During the summer of 1922 a number of vessels from foreign ports proceeded up the St. Lawrence River to Chicago, Ill., and other ports on the Great Lakes. Because of the lack of quarantine facilities at lake ports and in view of the fact that all of the vessels passing up the St. Lawrence must necessarily pass the port of Ogdensburg, N. Y., it was decided to establish a quarantine boarding station there for the inspection of all foreign vessels proceeding to ports on the Great Lakes. Accordingly on March 18, 1924, the Secretary of the Treasury issued a circular formally designating the port of Ogdensburg, N. Y., as the quarantine station for all vessels destined via the St. Lawrence River to ports on the Great Lakes.

*Portland (Me.) quarantine.*—Acting Asst. Surg. Albert F. Stuart in charge.

Seventy-four dead rats collected from fumigated vessels were sent by express to the laboratory of the quarantine station at Boston, Mass., for bacteriological examination as to plague infection. No infection was found among them.

Wiring of buildings for electric lights and the construction of a power house and storehouse are contemplated. Present buildings need inside plaster repairs and painting.

Repairs to tugs and launches have placed the floating property in excellent condition for service.

No quarantinable diseases were observed during the year.

*Port Townsend (Wash.) quarantine.*—Surg. J. R. Hurley in charge.

No quarantinable diseases were encountered during the year.

The number of ships entering quarantine, the number of crews and passengers inspected, the number of ships fumigated, and the total amount of quarantine fees collected exceeded any previous year in the history of the station.

The following tabulated summary shows the increase of activities during the past four years:

	Fiscal year			
	1923-24	1922-23	1921-22	1920-21
Vessels inspected.....	433	303	283	187
Total crews.....	32,061	25,786	21,411	13,909
Total passengers.....	18,350	8,513	5,980	7,500
Total vessels fumigated.....	86	56	59	9
Total quarantine fees collected.....	\$11,433.63	\$6,734.25	\$6,668.88	\$212.09

This increased work has been performed with no increase in the number of officers or men at this station or in equipment.

This growth in quarantine operations has increased with the growth in population of the Northwest and with that of the commerce of the ports of Seattle, Tacoma, Anacortes, Bellingham, and other cities on Puget Sound during the corresponding period, and it will undoubtedly continue to increase in future years.

The sums allotted to this station for operating and maintenance purposes (exclusive of salaries) for the year 1923-24 totaled \$7,060.67. Of this amount there was actually spent during the same period a total of \$6,066.41 and there was collected as quarantine fees at this port a total of \$11,433.63. It will be seen that, excluding salaries, this station was not only self-supporting but produced an income amounting to \$5,367.22.

The quarantine officers, by arrangement with the Seattle office, conducted the medical inspection of arriving aliens among cabin passengers and of the crews of freight vessels. During the last few weeks of the year, owing to the abnormal increase in the number of Japanese steerage passengers seeking admittance to the United States before the immigration act of 1924 went into effect (July 1, 1924), the medical inspection of the crews of arriving passenger liners was conducted by the quarantine officers at this port.

Certain steamships engaged in carrying passengers, mail, and valuable cargoes of silk were saved many hours by the continuance of the system of inspecting these vessels while en route from Victoria to Port Townsend or from Port Townsend to Seattle, thus obviating the necessity of anchoring and awaiting the completion of the quarantine inspection at Port Townsend. If a vessel arrived at Port Townsend too late for inspection, approximately 12 hours would be saved by this procedure.

The Port Townsend quarantine station is located on Diamond (or Clallam) Point, in the Straits of San Juan de Fuca, at the entrance to Discovery Bay, about 12 miles distant by water from Port Townsend.

The station reservation comprises a total of 156 acres of which 15 acres has been cleared. Bordering the clearing on the northeast is about 40 acres of lagoon and tidal lands. The unoccupied 101 acres is hilly and covered with a very dense stand of fir, spruce, and other trees. The station is accessible only by boat and is isolated, the nearest road being about 5 miles away. All boarding and fumigating of ships is conducted from Port Townsend.

A new salt-water fire-protection system, consisting of a 100,000-gallon steel tank located well up on the hill to the rear of the station buildings, a powerful pump operated by gasoline motor, and a complete system of mains and hydrants was installed under contract at a cost of \$24,350.

The underground pump house for the fresh-water supply system, dimensions 8 by 16 by 7 feet, was reconstructed by the station force, reinforced concrete being used throughout, at a cost, for materials only, of \$152.05.

A new coal shed of frame construction was erected by the station force from materials on hand without additional expense to the Government.

A new vertical, submerged type, 18-horsepower steam boiler was procured and installed in the laundry building; the former stable has been partially reconstructed for use as a garage; the wooden

supports to the two lower 12,000-gallon fresh-water supply tanks were in part renewed with 12 by 12 inch timbers; and the supports and tanks were repainted. The stercage passengers mess hall and kitchen, bathhouse, and carpenter shop were painted by the station force.

The dirt road, approximately a quarter of a mile long, extending from the wharf up the hill to the attendants' quarters and other buildings, was resurfaced with gravel excavated on the station property near the beach.

The post bakery building at Fort Worden was fumigated twice with cyanide for the destruction of vermin upon the request of the post quartermaster.

The mine planter *Major General Franklin J. Bell* was fumigated with cyanide at the request of her commanding officer.

The Coast Guard cutter *Snohomish* was fumigated with cyanide at the request of her commanding officer.

The piles under the wharf at Diamond Point station are in bad condition, through inroads by teredoes, and should be replaced by new creosoted piles to the number of about 100. This, together with certain other repairs required by the wharf, if done under contract, it is estimated would cost approximately \$10,000.

A new storehouse is needed. This can be built by the station force if approximately \$1,000 worth of lumber and other materials are supplied.

*Providence (R. I.) quarantine.*—Surg. W. A. Korn in charge.

While the number of vessels arriving at this port and requiring quarantine inspection was slightly less than during the preceding year, when a considerable number of vessels arrived from British ports, owing to the coal situation in the United States, the number of transactions was nearly normal as compared with previous years.

The port of Providence is one of the larger oil terminals on the Atlantic coast, and most of the ships inspected were engaged in that trade. The remainder were passenger-carrying steamships from Mediterranean ports and the Azores, schooners transporting lumber and salt, and several small schooners bringing passengers from Cape de Verde.

No quarantinable diseases were found on any of these vessels.

The hulk *Newark* has been painted. The small gasoline-motor boarding launch has been equipped with a new 15-horsepower, 2-cycle, 2-cylinder Knox engine and the hull resheathed. The launch *Hugh Ward* is laid up in accordance with bureau instructions.

This station, with the exception of the office located in room 304, Federal Building, in the city, is a floating station, situated on the hulk *Newark*, at anchor in the harbor about 2 miles below the city. While facilities are sufficient to care for the crew of any freight vessel detained, they are inadequate to provide the necessary accommodations for the personnel on board the average passenger-carrying steamship. Not more than 100 persons can be cared for on board the *Newark*, and it will be necessary to remand to some other station any persons who might be detained in excess of this number.

*Reedy Island (Del.) quarantine.*—Post-office address, Port Penn, Del.; telegraphic address, Reedy Island, Del.

This station is maintained as an adjunct to the boarding station at Marcus Hook, Pa. If a large passenger vessel destined for the port of Philadelphia should arrive with quarantinable disease on

board, it would be necessary to use this station for the appropriate treatment of passengers and crew.

*Sabine (Tex.) quarantine.*—Surg. T. J. Liddell in charge.

The Lake Sabine district comprises the ports of Beaumont, Port Arthur, Orange, Port Neches, Sabine Pass, and Sabine. All vessels entering this district are inspected and, if necessary, treated or fumigated at Sabine.

As the present station is inadequate, the building of a new station is recommended. The building of this new station has been delayed for several years owing to the fact that the service has not been able to consummate the purchase of the quarantine properties assumed to be owned by the State of Texas. It is hoped that in the near future an agreement will be reached and that a modern quarantine station will then be erected. The present station consists of one set of quarters, a rented office and storeroom, and the steamship *Lake Elmdale*, a United States Shipping Board vessel, used for detention purposes. The residence of the medical officer is badly in need of repairs, but can not be repaired because the property does not belong to the Public Health Service.

The floating equipment consists of two gasoline-engine launches, the *Willie Hobby* and the *Everitt Sherrill*, and a skiff. Both launches have been overhauled and have rendered quite satisfactory service during the year.

A quarantine anchorage was selected and the boundary approved by the Secretary of the Treasury.

A practically new  $\frac{3}{4}$ -ton motor truck and two used motor cycles were received during the year.

There were 21 persons detained on the steamer *Lake Elmdale* to complete six days on account of the regulations for preventing the importation of yellow fever.

*San Francisco (Calif.) quarantine.*—Surg. R. H. Creel in charge. Post-office and telegraphic address, Angel Island, Calif.

While the administrative headquarters of this station, with detention and disinfection facilities, are located on Angel Island, the inspection service and the fumigation operations are conducted from the office on the San Francisco water front.

Service operations have been directed toward the prevention of the introduction of the various quarantinable diseases, but because of the intimate trade relations between San Francisco and plague-infected ports of the Orient measures against the introduction of plague have received the greater attention. As the *Aedes ægypti* is not found in this section of the country, the danger from yellow fever is regarded as negligible. Likewise, because of the prolonged voyage of vessels coming from typhus-infected ports and ports where cholera prevails, the potentialities as to the introduction of these two diseases are regarded as being slight. No typhus was observed on any vessel entering San Francisco, nor was there elicited a history of any typhus cases during the voyage.

During the year 562 vessels were fumigated for the destruction of rats, 497 by hydrocyanic-acid gas, or cyanogen chloride, and 65 by sulphur dioxide. As a result of this procedure, 3,606 rodents were recovered from the fumigated vessels and delivered to the laboratory for autopsy. None was found to be infected. Of the number of rats recovered, 1,487 were *Mus alexandrinus*, 1,223 *Mus rattus*, 34 *Mus norvegicus*, 86 unidentified, and 776 *Mus musculus*. These figures

are in accord with the usual findings as to disparity between the Norway rat and the *alexandrinus* and *rattus*, and bears out the fact that the Norway rat is but seldom found on board vessels. Approximately two-thirds of the rodents recovered were found in the holds of the vessels and the remainder in the superstructures. Of the latter group; 581 were taken from storerooms, 120 from galleys, 150 from crew's quarters, and the remainder from miscellaneous superstructures (including lifeboats), but chiefly from the poop deck, where there is always more or less dunnage stored. Of the 562 vessels fumigated, 323 were direct from plague-infected ports of the Orient or South America. The others were fumigated in accordance with the regulations pertaining to periodic fumigation. It is notable that of the vessels fumigated no rats were recovered on 319 vessels. To some extent this negligible result may have been due to the fact that some of the vessels, being cargo-laden, the rats having been killed in the cargo were not found by the fumigators while searching the compartments; but for the most part it is believed this result is due to an actual reduction in the number of ship-borne rats, a condition that probably is very largely attributable to the repeated fumigation of regular line vessels.

The employment of cyanogen chloride has continued to be very satisfactory, both as to efficiency and to the safeguard, due to its warning lachrymatory quality. During the year no accidents have been reported in connection with the fumigation of vessels at this port. Some difficulty has been experienced because of the variation in the HC content of the various brands of hydrochloric acid supplied by the department. When the HC content has been low, the reaction has been retarded, and the generation of gas progressed slowly, so that the maximum concentration was delayed. This deficiency was partially overcome by lowering the proportion of water and reducing the amount of sodium chlorate. The variation in the proportion of chemicals employed, however, has to be regulated with great care. In several instances where the amount of water was reduced, fires were observed in the gas generators, none of which resulted in any harm, although the possibilities were serious. It is believed that the combustion was due to the rapid action of the acid on the chlorate evolving oxides of chlorine before the cyanide entered into the solution. It is known that the oxides of chlorine are both combustible and, to some extent, explosive. By graduating the amount of acid and water to the proper proportions and crushing the cyanide the tendency toward combustion has been eliminated, and no fires have occurred during recent months.

A number of vessels from the Orient have reported cases of smallpox en route, but in each instance the case had been discovered shortly after departure of the vessel from the foreign port, so that with the vaccination at the latter place, the isolation of the case, and the measures taken at Honolulu, it has not been found necessary to retain any passengers or crew at this port on account of smallpox or infected ships.

Ship's manifests have been carefully examined to prevent the admission of anthrax-infected brushes from the Orient. Any consignment of brushes that was not accompanied by a consular certificate that the bristles or hair had been sterilized before manufacture of the brushes was rejected.

## EXPERIMENTAL STUDIES

Tests were carried out in the station grounds to determine the relative toxicity and diffusibility or penetration of cyanogen chloride and hydrocyanic-acid gas.

The laboratory building was employed for this purpose, the test animals (captive *mus norvegicus*) being confined in large metal cans protected by layers of bunting—from one to six layers. Without going into details, it seemed conclusively evident from the results that cyanogen chloride, in the strength prescribed by the regulations, is as toxic and as diffusive as is hydrogen cyanide of similar strength. Other studies carried out along similar lines seemed to indicate that because of the warning given by the lachrymating properties of cyanogen chloride, the rats were able to secure cover, where available, and thus protect themselves from the gas to a greater degree than when hydrogen cyanide is used. In the studies made the animals buried deeply into straw and excelsior when cyanogen chloride was employed and were able to survive for a longer period of time than when the hydrogen cyanide was used. All test animals were killed, but it seems probable that in cargo-laden holds and compartments hydrogen cyanide will prove more effective than cyanogen chloride for rodent destruction.

Tests have also been made as to the utility of calcium cyanide instead of sodium cyanide. These tests indicated that the use of the former product is not practicable in hydrogen cyanide or cyanogen chloride fumigation. The reaction of the acid upon the calcium cyanide was so violent that unless the amount of chemicals used in each container was considerably diminished it dispelled a considerable amount of the fluid from the containers, thus quadrupling the amount of equipment necessary.

## PHYSICAL IMPROVEMENT

During the year a new lighting plant was installed at the station. It is a 25-kilowatt generator operated by a semi-Diesel engine with a 60-cell storage battery. An abundant current is at all times available for the station's need at a cost for operation of about \$8 per month. The deep well installed during the preceding year has continued to afford an ample supply of water. Additional storage space has been secured by the construction of a basement room beneath building No. 8, by alterations in the garret of building No. 13, and by the flooring of the wharf shed. This additional storage space meets a rather pressing need of the station. Without expense to the Government there has been secured a considerable number of evergreen trees, pines, and cypress, and various shrubs, which will greatly enhance the physical appearance of the station. Several buildings have been painted by the station force and the roads have been repaired.

Cordial relations have been maintained with other branches of the Government and valuable assistance has been received and extended. Station administration has been greatly aided by the transportation afforded by the Immigration Service for passengers and freight between the San Francisco water front and the immigration station located near the quarantine station. This aid has been reciprocated through the loan of the quarantine steamer *R. M.*



Woodward for transport service when the regular immigration steamer was out of commission. The service is indebted to the collector of customs for the transportation to vessels of boarding officers when the quarantine steamer was out of commission or otherwise employed. From the Army post, Fort McDowell, located near by, many courtesies and much helpful assistance have been received.

*San Pedro (Calif.) quarantine.*—Surg. R. H. Heterick in charge.

The transactions at this station were considerably increased over the preceding year. The number of vessels inspected was increased from 1,082 to 1,559, and the number of vessels fumigated from 56 to 131.

The launch *S. D. Brooks* (formerly *Sea Parrot*) was received from Port Aransas, Tex., January 30, 1924. As it arrived in poor condition extensive repairs were necessary.

A  $\frac{3}{4}$ -ton truck for use in fumigating was also received.

It is recommended that the use of cyanide for fumigation be introduced immediately, that a new engine be installed on the launch, that an additional employee to act as deck hand be authorized, and that a temporary acting assistant surgeon be appointed for duty when one of the medical officers is absent from the station.

The personnel of this station consists of the medical officer in charge; an acting assistant surgeon; clerk; pilot for the launch; 1 attendant, whose duties include the fumigation of vessels; 1 rat-guard inspector; and 1 truck driver, who is also deck hand on the quarantine launch.

*Savannah (Ga.) quarantine.*—Acting Asst. Surg. Barton Brown in charge.

The remainder of the equipment for the light plant was received and installed. The piers are now wired as well as the buildings. All of the work was done by the station force. The light plant is giving satisfactory service. No quarantinable diseases were encountered; therefore no vessels were detained.

The cabin detention barracks, attendants' kitchen and mess hall, new laundry, boathouses, the metal roofs of the office, and the pharmacists' and medical officer's quarters have been painted.

#### TEXAS BORDER STATIONS

*Quarantine transactions on the Texas-Mexican border for the fiscal year ended June 30, 1924*

	Brownsville	Eagle Pass	El Paso	Hidalgo	Laredo	Pre-sidio	Rio Grande and Roma	Terrlingua	Total
Number inspected from interior Mexico.....	2,793	4,053	28,113	4,598	39,654	555	314	80	80,160
Number of local passengers inspected.....	707,315	724,364	2,007,039	30,843	1,096,645	6,438	34,050	954	4,607,648
Total number of persons disin-fected.....	205	10,713	65,339	0	24,217	0	52	0	100,526
Total number of persons passed without treatment.....	706,641	717,704	1,969,813	35,019	1,091,483	6,271	34,350	741	4,562,022
Total number of persons vac-cinated.....	3,246	2,796	34,544	378	44,816	708	805	285	87,578
Total number of sick held for observation.....	0	0	0	0	3	0	11	0	14
Total number of sick refused admission.....	16	615	36	44	4	14	46	0	775
Total pieces of baggage disin-fected.....	5,412	12,468	15,848	0	12,860	661	66	0	47,315

*Brownsville (Tex.) quarantine*.—Acting Asst. Surg. G. D. Fairbanks in charge.

Mosquito eradication is being actively carried on all along the border on the American side.

The activities of the office have been directed toward vaccinating all persons who do not show evidence of immunity to smallpox and to keeping out other diseases by close inspection. The vaccination work alone is worth the maintenance of the service. Formerly smallpox was endemic in these counties, but now it is a rare occurrence.

Leprosy is quite prevalent in this locality.

One train a day is passed over the international bridge and is inspected by the medical officer.

*El Paso (Tex.) quarantine*.—Passed Asst. Surg. J. W. Tappan in charge.

Vaccination against smallpox has been continued as usual. An inspector is on duty at all hours during which the port is open for traffic for the purpose of inspecting passengers for recent successful vaccination against smallpox. Those who do not show evidence of having had smallpox or a recent successful vaccination are vaccinated. The incidence of smallpox in El Paso during the year has been less than usual, only four cases having been reported since January 1.

Bathing and delousing methods against typhus are strictly enforced. As formerly, passengers from the neighboring settlements around Juarez, as well as those from the interior of Mexico, who are obviously clean and not louse infested, are permitted to pass for inspection without going through the disinfecting plant. All immigrants, however, who correspond to the steerage class at seaports of entry are required to bathe, have their clothing and baggage disinfected (deloused), and submit, if necessary, to vaccination. The working classes from Juarez, known as locals, are required to pass through the plant once a week. A bath certificate is issued to them and taken up after eight days, a new certificate being issued after each disinfection.

Although travel from the interior of Mexico was frequently interrupted during the year, owing to internal conditions in that country, there was little, if any, difference in the amount of work accomplished at this station compared with previous years. Scrutiny is made by a medical officer of passengers on trains of the Mexico national lines crossing the international bridge from Juarez to the union depot, El Paso, for excludable diseases from the standpoint of both quarantine and immigration. This examination includes inspection for evidence of recent successful vaccination against smallpox. During the year these trains have been crossing the bridge into El Paso at very irregular hours, often late at night, as the customs service permits this under a special bond. It is understood that during the coming year the Mexican customs authorities will not permit trains to cross the bridge later than 6 p. m.

From May 1 to November 1, 1923, passengers from Tampico, Panuco, Tuxpam, and other localities suspected of having yellow fever were refused admission until the six-day detention period specified by the bureau should have been completed.

Active cooperation has been rendered Sanitary Engineer R. E. Tarbett, in charge of yellow fever control measures along the border,

with headquarters at this station, in mosquito-eradication work. State, county, and city health officers have also been aided in general health measures. The medical officer in charge, together with Sanitary Engineer Tarbett, was designated by the bureau to act in an advisory capacity to the city health department of El Paso during the absence of the city health officer, covering a period of about nine months.

*Hidalgo (Tex.) quarantine.*—Acting Asst. Surg. W. P. Woodall in charge.

Service operations have been carried out as in previous years and directed chiefly against the introduction of smallpox and yellow fever.

There has been a notable decrease in the traffic from those sections of Mexico most liable to convey quarantinable diseases, none of which have been observed or reported that could be traced to Mexico.

The usual mosquito-control measures carried on by the Public Health Service and local authorities have resulted in a material abatement of the dangerous varieties of mosquitoes.

*Laredo (Tex.) quarantine.*—Acting Asst. Surg. Nat. K. King in charge.

The service operations at the port of Laredo have been carried out during the past fiscal year in the same manner as in previous years, consisting chiefly of activities to prevent the introduction of typhus fever and smallpox into the United States and eradication measures against the *Aedes ægypti* mosquito along the Texas-Mexican border.

The regular routine inspection of all incoming travelers is carried out at the international railroad bridge and at the international foot and wagon bridge, where every precaution is exercised to prevent the introduction of any quarantinable, infectious, or contagious diseases into the United States.

The illegal entry of the laboring class by crossing the river at other than the regular ports of entry, by wading the river or by rowboats, has been the cause of great concern at this station for fear these illegal entries, not having been inspected or disinfected, will bring in typhus fever and smallpox. It is a well-known fact that thousands pass in this illegal manner on account of the vast stretch of border and the limited number of guards to prevent clandestine crossings. This service has two quarantine guards (using automobiles) to work along the river frontage in this vicinity, who, cooperating with the immigration guards, have to a great extent limited this irregular practice. During the past year hundreds of persons were apprehended and deported for illegal entries. The majority of these were found to be louse-infested, and many were diseased or otherwise physically defective.

*Tabulated report for the year ending June 30, 1924*

Illegal entries apprehended and delivered to the immigration office at the international footbridge by the quarantine guard:

Mexicans.....	634
Spaniards.....	5
Syrians.....	2
Italians.....	1
Greeks.....	1
Englishmen.....	1

Germans.....	1
Lithuanians.....	1
Roumanians.....	1
Number examined, vaccinated, and released.....	342
Transactions at Zapata, Tex.:	
Number of persons from the interior of Mexico.....	760
Number of persons vaccinated.....	1, 402
Number of local persons.....	4, 872
Sent back because of sickness.....	2

*Presidio (Tex.) quarantine.*—Acting Asst. Surg. W. C. Moore in charge.

The usual preventive measures were carried out to prevent the entrance of quarantinable diseases into the United States from Mexico, and active cooperation with the local health authorities in preventing the spread of dangerous communicable diseases along the border in this district was maintained.

The service representative has no record of smallpox having prevailed; however, vaccinations have been performed when indicated.

Special attention has been given to the mosquito situation with reference to yellow fever.

*Rio Grande and Roma (Tex.) quarantines.*—Acting Asst. Surg. G. W. Edgerton in charge.

The duties of this office in Rio Grande are performed in a building owned by the Public Health Service, furnished by the Immigration Service, and occupied jointly by both services.

Service transactions at Roma are performed in a building jointly with the Immigration and Customs Services. No facilities for delousing or disinfection are available at Roma, nor could these duties be performed without the employment of the necessary personnel at that station.

It has been the policy of this office to seek the cooperation of the Mexican health authorities in the towns of Camargo and Mier, Mexico, situated opposite Rio Grande and Roma, respectively. Official visits have been exchanged and reliable information as to the conditions prevailing in the districts under the supervision of these authorities has been obtained, thus avoiding strict quarantine procedures and permitting modified measures as to the mutual recognition of certificates.

During the latter part of June, 1924, several cases of typhus fever were diagnosed in Rio Grande and vicinity, and precautions are being taken to guard against the importation of this disease from Mexico. To date we have not been able to trace the origin of this infection.

The State health department has been kept advised of the work performed by this office and of the incidence of infectious disease.

The number of persons vaccinated and certified had nearly doubled in comparison with the preceding year and the number of persons deloused has decreased. The local passengers are doing the delousing at home. The immigrants crossing during the cotton season were nearly all from a restricted area and knew of the regulations here and came prepared. Those coming from the interior were not of the same health standard as last year, consequently the increase in vaccination and certificates.

## TRANSACTIONS AT INSULAR QUARANTINE STATIONS

*Summary of transactions at insular stations for fiscal year ended June 30, 1924*

Station	Vessels inspected	Vessels fumigated	Passengers and crews inspected	Bills of health issued
Aguadilla, P. R. <sup>1</sup>	6	0	88	-----
Ahukini, Hawaii	0	0	0	0
Arecibo, P. R. <sup>1</sup>	5	0	134	-----
Arroyo, P. R. <sup>1</sup>	6	0	51	-----
Cavite, P. I.	30	0	5,747	21
Cebu, P. I.	79	38	4,697	244
Central Aguirre, P. R. <sup>1</sup>	0	0	0	-----
Christiansted, Virgin Islands <sup>2</sup>	46	0	439	-----
Fajardo, P. R. <sup>1</sup>	65	0	458	-----
Frederiksted, Virgin Islands <sup>2</sup>	59	0	3,987	-----
Guanica, P. R. <sup>1</sup>	93	7	5,172	-----
Hilo, Hawaii	36	7	2,187	0
Honolulu, Hawaii	565	32	143,948	0
Humacao, P. R. <sup>1</sup>	16	0	153	-----
Iloilo, P. I.	46	41	2,476	157
Jolo, P. I.	39	0	2,999	16
Kahului, Hawaii	12	1	324	0
Koloa, Hawaii	6	0	120	0
Lahaina, Hawaii	1	0	42	0
Mahukona, Hawaii	3	0	87	0
Manila, P. I.	851	151	115,332	1,002
Mayaguez, P. R. <sup>1</sup>	61	2	2,772	-----
Olongapo, P. I.	0	0	0	0
Ponce, P. R. <sup>1</sup>	98	0	1,794	-----
St. Thomas, Virgin Islands <sup>2</sup>	526	26	19,943	-----
San Juan, P. R.	371	109	24,316	728
Zamboanga, P. I.	28	0	2,755	131
Supports of Porto Rico	-----	-----	-----	1,786
Virgin Islands ports	-----	-----	-----	493
Total	3,048	414	340,021	4,578

<sup>1</sup> Supports of Porto Rico.

<sup>2</sup> Virgin Islands ports.

## REPORTS FROM INSULAR QUARANTINE STATIONS

## OPERATIONS OF THE SERVICE IN HAWAII

Surg. E. A. Sweet, chief quarantine officer. Post-office and telegraphic address, Honolulu, Hawaii.

Substations are maintained at the ports of Hilo, Mahukona, Koloa, Ahukini, Lahaina, and Kahului.

Toward the close of the last fiscal year a conference was held with representatives of the chamber of commerce and various shipping interests regarding modification in the inspection system of vessels from domestic Pacific coast ports. It was explained that sanitary conditions were such that there appeared to be but little necessity for the continuance of the existing system if the transportation companies were willing to meet certain requirements. An agreement was reached whereby vessels engaged exclusively in trade between the Hawaiian Islands and mainland ports of the United States would be exempted from further quarantine inspection if they would carry medical officers, attend to the vaccination of crews and steerage passengers, and promptly report cases of communicable diseases which might occur on board. This modification became effective July 1, 1923, and remained in force until February 13, 1924, when, following an outbreak of smallpox in southern California, inspection at quarantine was again resumed.

Thirteen cases of quarantinable diseases on 10 different vessels were noted during the year. Five of these cases were leprosy, and

in four instances the passengers were traveling under prescribed regulations so that no action was required. The fifth case was diagnosed on a vessel arriving from San Francisco on October 23. In the eight remaining instances the disease was smallpox, the infection having developed on six different vessels.

On November 5, 1923, the steamship *President Wilson* arrived from Yokohama with two cases of smallpox among the steerage passengers. The sick persons were isolated in the hospital and the remaining members of the steerage, 268 in number, were removed to quarantine and held for immunity tests, while the vessel was fumigated and passed.

The steamships *President Lincoln* and *Taiyo Maru*, which arrived on December 7, 1923, and January 5, 1924, respectively, reported cases of smallpox en route; but inasmuch as 14 days had elapsed since the date of isolation in each case, the vessels were inspected and passed.

On December 28, 1923, the steamship *President Taft* arrived at quarantine and reported a fatal case of hemorrhagic smallpox at sea in the person of a Chinese steerage passenger. Through an oversight the child had escaped vaccination at Shanghai, but it was not until several days had elapsed that this fact was discovered. Vaccination was then performed, but it was too late to prevent the development of a malignant type of smallpox. The entire steerage complement of this vessel, 279 in number, were held for immunity tests.

The steamship *President Cleveland* arrived on January 8 with one steerage passenger and one first cabin passenger ill with smallpox. Both cases were removed and the cabin passengers destined for Honolulu were released after a few hours, a sufficient degree of isolation having been maintained during the voyage to make this procedure feasible.

On February 17 the *President Lincoln* again arrived with a steerage passenger ill with smallpox. One hundred and thirty contacts were detained. As the remaining members of the steerage showed positive reactions to the immunity test performed the previous day by the ship's surgeon, they were permitted to proceed.

The only remaining infection of a suspicious nature was found on the steamship *Ginyo Maru*, which arrived from South America and Mexican ports on July 8, 1923. Upon inspection a steerage passenger with a temperature of 39° C. and marked jaundice was discovered. The patient was removed to quarantine under proper safeguards, and the vessel was held for 36 hours until it was evident that the disease was not yellow fever.

A determined effort has been made to obtain the successful vaccination of the crews of all vessels entering ports in the Hawaiian Islands. To this end regular inspections of the personnel of all arriving vessels have been made, and the individuals failing to show satisfactory scars were vaccinated. A total of 990 vaccinations, mostly on tramp vessels, were performed by this office. In addition, the ships' surgeons of the various lines, in compliance with orders, have immunized several times this number. It is believed that all of the personnel of vessels on regular voyages to Hawaiian Islands ports are now vaccinated.

As illustrating the necessity for action of this character, mention should be made of the fact that three known instances of smallpox

developing on vessels after their departure from this port have occurred during the year. In the first case the infection was contracted in a mainland city of the United States. The patient was in good health upon arrival at quarantine, but became ill the day of his departure for the coast. A second instance was that of a musician on a trans-Pacific vessel, who came down with the disease four days after his departure from Honolulu. A secondary case resulted and was removed at Manila. A third patient arrived from a mainland city in apparent good health, remained at a Honolulu hotel for a week, a portion of which time he was in the eruptive stage of the disease, took passage for his return, and was diagnosed as smallpox the second day out.

Efforts also have been made to secure the vaccination, when conditions indicated, of a larger proportion of incoming passengers. There are still people, although their number is small, who visit the Orient without ever having been successfully vaccinated. These persons are a menace to other communities. The same statement holds true for the unvaccinated who travel from any endemic smallpox area and arrive at their destination within 14 days from the date of departure.

The unusual prevalence of smallpox in Southern California during the spring months has necessitated restrictive measures at this port. A system was established whereby unvaccinated persons coming from smallpox districts reported daily at the quarantine office. By this system it was hoped to accomplish two purposes—first, to obtain immediate notification should a case of the disease develop, and, secondly, to encourage vaccination. The latter object was not attained, chiefly owing to the fact that the steamship companies were negligent in notifying prospective passengers of the desirability of such action, but also because of the reluctance of seafarers to undergo vaccination at the beginning of a voyage. On several vessels coming directly from ports where smallpox was present in epidemic form, as high as 20 per cent of the passengers were found to be unvaccinated. The situation was such that it seemed advisable to lay the facts before the territorial board of health for such action as was deemed warranted. That body, after obtaining a decision from the attorney general as to its legality, issued a regulation, approved by the governor, to the effect that passengers who had embarked at Pacific coast ports must have been successfully vaccinated, or in lieu thereof were subject to detention to complete 14 days from the date of sailing. The territorial board of health requested that this office enforce this regulation. Similar requirements had been set forth covering passengers from foreign ports, and the two orders became effective on June 21, 1924. The effect of these orders was immediate, and the number of unvaccinated passengers dropped to zero. While some complaint was made regarding such rigorous measures, on the whole but little opposition was encountered, and a surprisingly large number of passengers, even among the unvaccinated, expressed their approval.

The geographical position of the Hawaiian Islands is such that it is feasible to debar many exotic infections at ports of entry. Serious economic losses have been sustained by the introduction of such foreign pests as the Mediterranean fruit fly, the mongoose, the mosquito, the so-called Japanese beetle, and the leaf hopper; and

it is not strange that the community has come to recognize that reasonable measures of precaution are justified.

The station has used the immunity test for smallpox throughout the year with satisfactory results and a considerable saving to steamship lines. On account of the frequency of coin scars,<sup>1</sup> which are difficult to distinguish from vaccination scars, among oriental passengers, it has been the practice in dealing with this class to hold all contacts to complete 14 days. In the case of occidentals, a scar upon the arm is a fair indication of partial or complete immunity to smallpox; in orientals no such conclusion can be drawn. The immunity test is therefore particularly valuable in dealing with people of the latter class. The test is accurate, easy to perform, and is especially adapted to shipboard work. The technique as developed at the New York quarantine station has been followed, two officers making the readings and agreeing upon the result before the contact is released. In one instance the ship's surgeon performed the tests on all steerage passengers the day previous to arrival. The readings were then made at quarantine and 68 per cent of the personnel were released immediately.

In a small percentage of cases no immune reaction is obtained, even though there is reason to believe that immunity exists. Such cases are held to complete 14 days from possible exposure to infection. Ordinarily it is expected that 80 per cent of all contacts will be released within 72 hours. Bills for the detention of passengers are correspondingly lowered, and the prospect of early release is gratifying to contacts. It would seem that the value of this test has not been fully appreciated.

Aid has been rendered to the territorial board of health in the preparation of media, as heretofore. The rodent work also has been continued in cooperation with that organization. The bodies of nine persons were cremated at the station crematory. Several vessels of the United States Navy were fumigated for the destruction of vermin, and advice was given to several organizations concerning sanitary problems.

This office received the cooperation of the Hawaiian Sugar Planters' Association in handling the personnel of infected vessels. Advantage has been taken of their facilities for the detention of those contacts who were Filipino laborers under their charge, if the possibility of secondary infection was remote. Similar assistance has been rendered by the United States Immigration Service in the case of contacts who were detained for a short period only.

In the interest of safety, cyanogen chloride has been substituted for hydrocyanic-acid gas as a fumigant and has proved satisfactory for the class of vessels, mostly of small tonnage, handled at this port. Recently this fumigant has replaced sulphur dioxide at the port of Hilo.

The customary rat-guard precautions have been continued, as heretofore, daily inspections of the water front being made to determine compliance with the regulations. The four full-time trappers who were employed by the territorial board of health, in cooperation with this service, trapped 10,696 rodents, classified as follows: *Mus alexandrinus*, 2,531; *Mus rattus*, 1,328; *Mus norvegicus*, 1,672; *Mus musculus*, 5,093; mongoose, 72. None was found to be plague-infected.

<sup>1</sup> Coin scars are produced by branding with a hot coin to simulate a vaccination scar.



The rodent and human plague situation on the Island of Hawaii, as reported by the territorial board of health, has shown some improvement during the year. But 1 human case was reported, although 12 infected rodents have been found. The number of rodents exterminated totaled 173,581, classified as follows: *Mus alexandrinus*, 88,014; *Mus norvegicus*, 14,886; *Mus rattus*, 48,650; *Mus musculus*, 87,817; mongoose, 1,022; unclassified, 12,392.

*Summary of transactions, Hawaiian Islands*

	Hono- lulu	Hilo	Mahu- kona	Kahu- lui	Lahaina	Koloa	Ahu- kiki
Vessels arriving.....	565	36	3	12	1	6	0
Vessels inspected and passed.....	530	35	3	11	1	6	0
Vessels boarded and passed.....	25	0	0	0	0	0	0
Vessels fumigated and passed.....	10	1	0	1	0	0	0
Crew inspected.....	64,368	1,699	87	324	40	120	0
Passengers inspected.....	79,580	488	0	0	2	0	0

OPERATIONS OF THE SERVICE IN THE PHILIPPINES

Surg. H. F. Smith, chief quarantine officer. Post-office address, Box 424, Manila, P. I.; telegraphic address, Quarantine, Manila.

INSPECTION AND DETENTION STATIONS

Service officers are stationed at the open ports of entry at Manila, Iloilo, Cebu, Zamboanga, Jolo, Cavite, and Olongapo. Cavite and Olongapo are in the customs district of Manila, but vessels of the Navy are permitted to go direct to the naval stations there.

Two quarantine stations are in operation—one at Mariveles at the entrance to Manila Bay, for the northern part of the archipelago, and one at the port of Cebu, for the southern section of the islands.

PERSONNEL

The personnel consisted of 4 commissioned medical officers, 2 full-time acting assistant surgeons, 4 part-time acting assistant surgeons on a fee basis, 1 pharmacist, and 77 quarantine attendants.

NATIONAL QUARANTINE

In conducting the quarantine work in the Philippine Islands, no new problems of any particular moment regarding the inspection of arriving vessels were presented during the year. There was a constant struggle with the officers of vessels to the end that correct bills of health be presented by vessels upon arrival. Since the present bill of health does not show the total number of persons on board, it is necessary to rely on the ship's papers. Vessels coming to a Philippine port via Yokohama, Kobe, Nagasaki, Shanghai, and Hongkong rarely present correct figures on their bills of health. At certain oriental ports it is a common practice to clear ships while they are tied up at their piers and a considerable period of time before departure. As a result of this procedure, it is rare that a passenger-carrying vessel arrives at Manila with the figures on the bill of health in agreement with the number of persons actually found. These discrepancies may be due to the fact that, after inspection, certain passengers decide not to sail and leave the vessel or to the fact that the steam-

ship companies sell transportation, including steerage, up to the time of sailing. Many steerage passengers board vessels and arrive at Manila who have never been seen by the consular officer who clears the ship.

The service was principally concerned in preventing the introduction of smallpox, plague, and cholera. Several cases of leprosy were brought to quarantine for isolation, and the presence of others on board was detected upon inspection. While inspecting arriving passengers and crews, typhus fever and yellow fever are always borne in mind, although these diseases are not likely to be encountered because of their general absence from ports in contact with the Philippine Islands. Nonquarantinable communicable diseases also are of interest to the quarantine officers, who work in harmony with the local health authorities in order to prevent the introduction of new strains. Past experience has shown that the introduction of foreign strains of diseases prevalent in the Philippines may be disastrous. This was the case with measles. The mortality from the strain of measles common in the Philippine Islands is nil, whereas the introduction of a strain from Shanghai some years ago and its communication to local residents resulted in a mortality rate almost as high as that which prevails in the United States. Before the epidemic could be controlled over 200 deaths occurred.

The question of inspecting vessels at the piers has been brought up a number of times by certain interests who wish to bring their vessels alongside the piers before or during the quarantine inspection. Since it is believed that it is unwise to delay the quarantine inspection until after a vessel has been berthed alongside a wharf, permission has not been granted for delaying this procedure. In the principal ports of the Philippines it is the usual practice for vessels to come alongside immediately after pratique has been granted.

*Summary of transactions at Philippine ports*

*Manila*

Vessels inspected from United States ports.....	219
Vessels inspected from foreign ports.....	632
Vessels fumigated and disinfected.....	150
Vessels held in quarantine.....	6
Crew inspected on arriving vessels.....	75, 242
Cabin passengers inspected on arriving vessels.....	16, 164
Steerage passengers inspected on arriving vessels.....	23, 926
Seamen examined for licenses.....	351
Bills of health issued.....	1, 002

*Marivetes*

Vessels at the station for treatment.....	38
Vessels fumigated and disinfected.....	6
Crew bathed and effects disinfected.....	652
Passengers bathed and effects disinfected.....	937
Persons detained in quarantine.....	1, 029
Number of pieces of baggage disinfected.....	7, 486

*Cebu*

Vessels inspected from United States ports.....	17
Vessels inspected from foreign ports.....	58
Vessels fumigated and disinfected.....	38
Crew inspected on arriving vessels.....	3, 393
Cabin passengers inspected on arriving vessels.....	31
Steerage passengers inspected on arriving vessels.....	773
Bills of health issued.....	244

*Iloilo*

Vessels inspected from United States ports.....	5
Vessels inspected from foreign ports.....	41
Vessels fumigated and disinfected.....	116
Crew inspected on arriving vessels.....	2, 393
Cabin passengers inspected on arriving vessels.....	82
Steorage passengers inspected on arriving vessels.....	1
Seamen examined for licenses.....	73
Bills of health issued.....	157

*Carite*

Vessels inspected.....	30
Crew inspected.....	3, 182
Passengers inspected.....	2, 565
Bills of health issued.....	21

*Olongapo*

Vessels inspected.....	0
Crew inspected.....	0
Passengers inspected.....	0
Bills of health issued.....	0

*Jolo*

Vessels inspected.....	39
Crew inspected.....	2, 471
Cabin passengers inspected.....	164
Steorage passengers inspected.....	364
Bills of health issued.....	16

*Zamboanga*

Vessels inspected.....	28
Crew inspected.....	1, 958
Cabin passengers inspected on arriving vessels.....	518
Steorage passengers inspected on arriving vessels.....	179
Bills of health issued.....	131

## QUARANTINABLE DISEASES AFFECTING THE PHILIPPINES.

It is of considerable satisfaction to report that, although plague is constantly present, it did not assume dangerous epidemic proportions in the ports of Hongkong, Shanghai, Amoy, Saigon, and Singapore. The incidence of cholera has been almost nil. Smallpox became epidemic at Hongkong and Amoy and was present at a number of other oriental ports.

The Philippine Islands have remained remarkably free from the major quarantinable diseases. Cases of cholera and smallpox were reported in small numbers. No cases of plague or typhus were reported. Leprosy is constantly present, and is, as heretofore, a considerable problem to the insular government.

## PLAGUE PREVENTIVE MEASURES

The Continent of Asia presents the greatest danger from plague, and, in view of the proximity of the Philippines to this constant focus of plague infection, the necessity for being constantly alert and putting into effect every possible preventive measure against the introduction of this disease is emphasized. The principal measures enforced consisted in requiring vessels to use rat guards on all lines leading to wharves and lighters, and to fend off from the wharves and quays at least 4 feet; in fumigating vessels to destroy rodents; and in inspecting vessels while they were being unloaded. During an exacerbation of plague at near-by foreign ports, vessels were fumigated every trip. After the epidemic had abated the period between fumi-

gations was extended to three months. Vessels calling\* at the Philippine Islands from any foreign port were required to be fumigated once every six months.

The legislature was asked to appropriate sufficient funds for the construction of a disinfecting shed which could be used for the fumigation of loaded lighters and similar small craft, but no appropriation was made. The fumigation of cargo has been the subject of discussion and consideration for some time; but it was not possible, because of lack of funds, to put into effect a number of the plans which have been worked out. The fumigation of vessels with cargo was done, in certain instances, by the use of cyanogen chloride.

Recommendations were made to the insular government to make appropriations for rat proofing the riprap between the Government piers, but no progress was made in that work. At Cebu, clusters of piles were driven along the outer side of the quay to keep vessels from lying in direct contact with the sea wall. At Zamboanga and Jolo additional fender piles were driven.

Rodents were found after fumigation as follows:

Manila, including Mariveles.....	1, 272
Cebu.....	380
Iloilo.....	503

All rodents found after fumigation at Manila and Mariveles were examined for plague infection at the laboratory of the Bureau of Science. A laboratory for the examination of rodents was built and equipped at Cebu for the examination of rodents found after fumigation at that port. At Iloilo there are no facilities for making these examinations.

#### SMALLPOX AND VACCINATION

Smallpox in epidemic form appeared at Amoy and Hongkong, the latter port having experienced its most severe outbreak since 1912. The tendency to spread was very persistent, and five vessels arrived at Manila with smallpox on board. The usual vaccination of passengers and crews, the segregation of contacts, and the disinfection of quarters were performed.

On March 6, 1924, after the arrival of the steamship *President Hayes*, which was the third vessel to arrive in the Philippines with smallpox on board, and in view of the increase of smallpox in Hongkong and Amoy, orders were issued for all vessels carrying passengers coming from Hongkong, Amoy, or Shanghai to call at the Mariveles quarantine station before proceeding to any other port in the Philippine Islands. These restrictions remained in force from March 6, to April 14, 1924, when the requirement that vessels call first at the Mariveles quarantine station was removed. With the improvement which gradually took place, the vaccination requirements were modified, but all persons were required to be vaccinated regardless of whether they were traveling first, second, or third class. These regulations are in force at the close of the fiscal year.

During the period in which vessels were required to call at the Mariveles quarantine station for inspection and treatment before proceeding to other Philippine ports, there arrived 32 vessels with 4,938 crew, 1,727 first-class passengers, 195 second-class passengers, and 1,187 steerage passengers. Persons with recent successful takes and those who showed immune reactions were released; all other

persons, 1,029 in number, were detained in quarantine for vaccination and observation.

The occurrence of smallpox made vaccination one of the principal activities of the service in the Philippines. At the beginning of the year it was customary to vaccinate all steerage passengers arriving in the Philippines from abroad. In view of the increase of smallpox on the China coast, vaccination of all arriving passengers and crews was required. Further, owing to the smallpox quarantine, a large number were revaccinated.

An effort was made to immunize all persons employed on interisland vessels against smallpox. Masters and agents of vessels were enjoined not to employ any person on board who did not possess a certificate of successful vaccination issued by the quarantine service. This requirement met with a very satisfactory response, and it was a daily occurrence to vaccinate persons who desired to be employed on interisland vessels. The shipping commissioner aided this office by refusing to employ persons who did not possess the required certificates. As a result, no case of smallpox was reported among the members of the crews of interisland vessels during the year.

#### DISINFECTION OF VESSELS

Five vessels arrived with smallpox on board and received the usual disinfection. The vessels which were used by the Philippine government in transporting lepers from the several ports of the Philippine Islands to the leper colony at Culion were disinfected at Mariveles upon the completion of each trip. Vessels from foreign ports having lepers on board, either transients or returning residents of the Philippines, were disinfected. No case of cholera, yellow fever, or typhus fever was encountered on any vessel.

#### OUTGOING QUARANTINE

At all of the ports of entry in the Philippine Islands, vessels proceeding to ports in the continental United States, or its dependencies, receive consular bills of health issued by the quarantine officers. This work corresponds to that of medical officers of the Public Health Service attached to American consulates. Shipping between the Philippine Islands and the United States has been constantly increasing. This applies not so much to the total bulk of cargo as to the number of shipments and the classes of cargo requiring investigation and inspection. Also, the number of shippers has increased out of proportion to the increase in the amount of cargo. A similar condition obtains in the case of passengers leaving the Philippines for American ports. Formerly, laborers traveling steerage came principally from the vicinity of Manila, where disease conditions were fairly well known, while at the present time the majority of these laborers are recruited from localities far distant from Manila, where modern methods of health administration and sanitation do not prevail. Many come from the mountainous districts of northern Luzon, the interior of the island of Cebu, and from the more densely populated districts of the southern islands. Vessels carrying passengers and leaving the Philippines for the United States without intending to call at any foreign port at which an officer of the service is stationed were inspected prior to sailing. Vessels which would later pass a port where inspection would be made by a service officer

were not inspected prior to sailing, and the bills of health were issued, annotated figures not verified. Vessels coming under the provisions of outgoing quarantine were fumigated every six months; others were fumigated when empty because they would not be empty at other ports when the usual six months' fumigation would be due. In the Philippines very few of the larger liners are ever empty, as they receive and discharge cargo at each port of call.

Very little opposition was encountered during the year to the enforcement of the quarantine laws in regard to departing vessels. It was the endeavor of the service to prevent delays, and no complaints were received. The cooperation of the steamship companies was had in almost every instance, and, as far as it has been possible to ascertain, no quarantinable diseases were taken on board vessels at Philippine ports.

In view of the fact that no epidemic of any quarantinable disease was reported in the Philippine Islands, the work of outgoing quarantine was less this year than usual. The work done in past years in connection with the Philippine Bureau of Health, as conducted by Surgeons Heiser, Fox, and Long, is bearing fruit.

*Summary of transactions, outgoing quarantine*

Bills of health issued.....	477
Crew inspected.....	5, 984
Passengers inspected, cabin.....	765
Passengers inspected, steerage.....	1, 060
Pieces of cargo certified.....	76, 148, 125
Vessels inspected.....	108

VETERANS' BUREAU ACTIVITIES

At all of the quarantine stations it was incumbent upon the service medical officers to perform some duty in connection with the beneficiaries of the United States Veterans' Bureau. This work was not heavy, but at times required considerable attention. In addition, the reserve officers of the Public Health Service were paid by the special disbursing officer of the United States Public Health Service at Manila.

AID TO OTHER SERVICES

The quarantine service was able to render considerable aid to other offices and bureaus of the government, as follows: Bureau of agriculture, disinfection of vessels which carried diseased animals; weather bureau, typhoon signals were displayed at quarantine stations; lighthouse establishment, maintaining a lighthouse at one of the quarantine stations; bureau of health, vessels used by the bureau of health in transporting lepers to Culion were disinfected and fumigated, and launch transportation was furnished a number of times for carrying out local public health activities; bureau of customs, physical examinations of seamen, examinations of aliens, medical service to aliens when necessary, dispensary and first-aid treatment to customs employees in emergencies, together with services of a minor nature which were rendered to other bureaus and departments of the government.

BUILDINGS AND STRUCTURES

At the several quarantine stations endeavor was made with the limited appropriation to keep the stations in as good condition as possible. At Mariveles the bathhouses and detention buildings

were painted inside and outside, as were also the group of buildings used as quarters and the administrative building. The heavy rains at times severely damaged the water system, and it was necessary to make extensive repairs, including the replacement of several lengths of 4-inch pipe.

During the preceding fiscal year the administrative and office building was practically reconstructed, all of the wooden partitions were removed and replaced with concrete partitions, the roof was renewed, and the wooden floor and joists were taken out and the space filled in, and a concrete floor laid to replace the old wooden floor. The unfinished work left from last year was completed.

The cabin barracks building is in such poor condition that it is not worth repairing, and in the near future will have to be condemned and torn down to avoid the danger from its collapse. A building for use as a morgue, a small hospital, and a new building for housing the electric-lighting plant, a refrigerating apparatus, and a steam laundry are badly needed at the station. Owing to lack of funds, it is improbable that any of these projects will be carried out in the near future. The wharf must have a new fender system during the coming year. The timbers are not withstanding the teredo, and one by one the clusters of fender piles are breaking off.

At the Cebu quarantine station a new reinforced-concrete tank for storing rain water with a capacity of 10,000 gallons was constructed.

In the basement of the building used as an office in the city of Cebu a rat-examination laboratory was constructed last year. It consists of a room with a cement floor, sink with running water, laboratory table, and lockers for disinfecting apparatus and instruments. The laboratory is used for examining the rats killed during the fumigation of ships.

The office building in the city of Cebu and the surgeon's residence on the quarantine station were painted inside and outside, and minor repairs were made to nearly all of the buildings on the station.

#### WATER-TRANSPORTATION EQUIPMENT

Constant endeavors, covering a period of years, to obtain a new launch for the service in the Philippines resulted this year in the transfer of the launch *Viola* from the bureau of commerce and industry. The hull was built in the Philippines of native hardwood, and a San Francisco standard gas engine was installed. As the launch was not serviceable when received, it was repaired at a cost of about \$4,000. This vessel is now being used for fumigation and boarding work at Manila, but may later be sent to either Iloilo or Cebu, as circumstances may demand. The other launches at Manila were also extensively repaired. Owing to their age and natural deterioration, the cost of the repairs required each year is extremely high. The same is true of the launches at Cebu and Iloilo, particularly in the case of the *Mariveles* at Iloilo, which is now more than 25 years old, is unable to make more than 5 miles an hour, and is uneconomical and inefficient.

Requests have been made every year for a long time on the Philippine Legislature for sufficient funds for the purchase or construction of a new launch, but, owing to the stringent financial crisis through which the local government has been passing, nothing has been accomplished.

## APPROPRIATION

The funds for the quarantine service in the Philippine Islands, which is administered as a bureau of the government of the Philippine Islands, are provided by appropriation by the Philippine Legislature. Since the fiscal year of the Philippine government is the same as the calendar year, the amounts available for the year from July 1, 1923, to June 30, 1924, include funds appropriated by the legislature for parts of two years. The amount appropriated for the year 1923 was \$71,414.50; the amount appropriated for the calendar year 1924 was \$76,714.50. There was available for expenditure during the year under report the sum of \$72,500.

Funds for the purchase of fixed assets, by which is meant equipment, furniture, tools, and articles of nonexpendable property, are provided for in a separate appropriation, which is subject to release by an emergency board which passes on the several items to be purchased before releasing the funds. The amount allowed the quarantine service, \$1,250, was inadequate. Equipment and other nonexpendable items to the value of nearly \$3,000 were recently condemned and should have been replaced. This was impossible, however, and the service was greatly crippled for want of proper equipment for carrying out the usual quarantine functions. It is hoped that financial conditions will improve so that a larger allotment may be obtained in the near future.

## EXPENDITURES

Expenditures totaled \$72,434.50, being divided into salaries and wages, \$45,261.73; supplies and ordinary expenses, \$18,981.83; repairs to equipment, \$8,190.94; and \$1,250 for the purchase of nonexpendable property from the special allotment controlled by the emergency board. There was a slight lessening of costs over the previous years, due to the fact that in some cases the cost of supplies has been considerably reduced. Coal, which formerly cost about \$20 per ton, has now decreased to approximately \$12 per ton, resulting in a considerable saving in the operation of the floating equipment and disinfecting plants. A small sum in the item of salaries and wages reverted to the treasury as an unexpended balance. All the sums allowed for supplies and materials were expended during the year.

## CYANOGEN CHLORIDE FUMIGATION

A number of vessels were fumigated with cyanogen chloride gas, and the results were very satisfactory. Supplies are now on hand, and at the close of the fiscal year rice-laden steamers from plague-infected ports were being fumigated to kill rodents prior to discharge of cargo.

## AIRCRAFT QUARANTINE

There were no transactions with aircraft arriving from foreign ports. During the quarantining of so many persons at Mariveles a number of trips to and from that station were made by airplanes. There is talk of an air-mail service, and if it is established the quarantine service is prepared to meet the demands for the inspection of the aircraft and their personnel.



## OPERATIONS OF THE SERVICE IN PORTO RICO

Surg. D. E. Robinson in charge. Post-office and telegraphic address, San Juan, P. R.

The activities of the service in Porto Rico include national quarantine, medical inspection of aliens, relief to seamen of the merchant marine, examination and treatment of beneficiaries of the United States Veterans' Bureau, certification of medicinal liquors for vessels, physical examination for the various Government services, and miscellaneous duties.

The personnel of the service at San Juan and 9 subports comprised the following: Chief quarantine officer, 13 acting assistant surgeons, 5 consultants, 4 clerks, and 30 attendants. The clerical force was reduced by 1 during the year.

All quarantine procedures are carried out at the port of San Juan, and vessels arriving at the subports requiring fumigation are ordinarily remanded to San Juan.

The duties of the officers at the subports of Ponce, Mayaguez, Aguadilla, Arceibo, Central Aguirre, Fajardo, Humacao, and Ensenada are the inspection of vessels, examination of arriving aliens, issuing bills of health, and certification of medicinal liquors when authorized.

No cases of quarantinable disease occurred at San Juan or subports during the year. Fumigation of vessels and cargoes was carried out, but no plague-infected rats were found.

*Summary of the quarantine transactions in Porto Rico*

	San Juan	Subports
Vessels inspected.....	371	350
Vessels fumigated.....	109	7
Crews inspected.....	14,575	9,142
Passengers inspected.....	9,741	1,480
Bills of health issued.....	728	1,786

Ordinary repairs to the building and floating equipment and improvements to the grounds, walks, etc., were made.

A small marine ways is badly needed at this station for the proper care of the floating equipment, such as painting and repairs.

## VIRGIN ISLANDS

Surg. J. E. Faris, chief quarantine officer, in charge. Post-office and telegraphic address, St. Thomas, Virgin Islands.

In addition to the main station located at St. Thomas, Virgin Islands, there are two substations maintained at St. Croix, Virgin Islands, one at Frederiksted, under the direction of Lieut. E. V. Goodbody (M. C.), U. S. N., and one at Christiansted, under the direction of Lieut. R. S. G. Welch (M. C.), U. S. N. Both of these officers cooperate with the chief quarantine officer in all matters relating to quarantine procedures.

The quarantine reservation, located at East Point, St. Thomas, Virgin Islands, is leased from the harbor board of St. Thomas. On this reservation are suitable unfurnished buildings for the isolation of personnel on account of quarantinable diseases. The equipment,

however, is inadequate, so that only a very limited number of passengers or crew can be detained at this station at one time.

During the fiscal year there has been no necessity for the detention of personnel on the reservation. Only one case of quarantinable disease was discovered on vessels arriving at this port, viz. one case of alastrim (smallpox) was found aboard the U. S. hospital ship *Mercy*; but since this case had been recognized and isolated upon its admission to the hospital ship, and the entire personnel of the vessel vaccinated against smallpox, the patient was allowed to remain aboard while in the port. Shore leave was restricted to the portion of the personnel that had not been in contact with the patient.

Since alastrim (smallpox) has been prevalent at Santo Domingo and Haitien ports, as well as at the Windward Islands, the personnel aboard all vessels from these ports have been required to show evidence of a successful recent vaccination or have been vaccinated before landing. Three hundred and ten persons were vaccinated before landing during the year.

During the year all vessels lying alongside piers in the Virgin Islands have been required to breast off at least 4 feet and have been ordered to use rat guards on all lines. No plague-infected rats were found on any of the piers.

Semimonthly reports upon the presence of the *Aedes ægypti*, and on rainfall, temperature, and antimosquito measures taken at this port have been forwarded regularly to the bureau.

In accordance with the act of Congress approved July 1, 1922, all quarantine fees received by collectors of customs at the several ports in the Virgin Islands have been turned into the treasury of the islands.

During the fiscal year a total of 493 bills of health have been issued to vessels leaving the three main ports of the Virgin Islands. Three vessels were reported to the Secretary of the Treasury as having failed to produce bills of health on arriving from foreign ports.

Routine repairs have been made to the buildings and structures on the quarantine reservation and to the floating equipment.

*Transactions at quarantine stations of the Virgin Islands for the fiscal year ending June 30, 1924*

Name of station	Steamships inspected	Schooners inspected	Sloops inspected	Total vessels inspected	Vessels fumigated	Passengers and crew inspected	Vaccinations
St. Thomas.....	272	86	168	526	26	19,943	310
Frederiksted, St. Croix.....	39	2	18	59	0	3,937	0
Christiansted, St. Croix.....	1	10	35	46	0	439	0
Total.....	312	98	221	631	26	24,369	310

*Bills of health issued at quarantine stations of the Virgin Islands during the fiscal year ending June 30, 1924*

Name of station	Number of bills of health issued
St. Thomas.....	351
Frederiksted, St. Croix.....	101
Christiansted, St. Croix.....	41
Total.....	493

*Bills rendered for quarantine services at maritime stations during the fiscal year ended June 30, 1924*

Station	Inspection of vessels	Fumigation of vessels	Subsistence furnished to ships	Miscel- laneous quarantine services	Total
	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Alexandria.....	0	0	0	0	0
Atchafalaya (Morgan City).....	0	0	0	0	0
Baltimore.....	7, 187. 00	26, 221. 73	0	1, 629. 77	35, 038. 50
Beaufort.....	0	0	0	0	0
Biscayne Bay.....	3, 070. 00	0	0	0	3, 070. 00
Boca Grande.....	325. 00	67. 03	0	0	392. 03
Boston.....	11, 905. 00	8, 576. 46	66. 00	0	20, 547. 46
Brunswick.....	185. 00	254. 90	0	0	439. 90
Cape Fear.....	348. 00	1, 091. 62	0	0	1, 439. 62
Cedar Key.....	0	0	0	0	0
Charleston.....	1, 813. 00	1, 370. 07	0	0	3, 183. 07
Columbia River.....	2, 992. 00	7, 590. 56	0	9. 50	10, 592. 06
Coos Bay.....	0	0	0	0	0
Cumberland Sound.....	35. 00	128. 99	0	0	163. 99
Darion.....	0	0	0	0	0
Delaware Breakwater.....	56. 00	0	8. 00	10. 50	74. 50
Eastport.....	0	0	0	0	0
Eureka.....	110. 00	0	0	0	110. 00
Fort Bragg.....	10. 00	0	0	0	10. 00
Fort Monroe.....	6, 145. 00	14, 526. 59	0	174. 00	20, 845. 59
Freeport.....	1, 465. 00	1. 00	0	0	1, 466. 00
Galveston.....	9, 379. 00	10, 567. 95	0	0	19, 946. 95
Georgetown.....	50. 00	0	0	0	50. 00
Gloucester.....	20. 00	0	0	14. 75	34. 75
Gulf.....	483. 00	622. 92	0	0	1, 105. 92
Hawaii.....	8, 748. 00	671. 78	2, 645. 50	249. 00	12, 314. 28
Hoquiam.....	700. 00	0	0	0	700. 00
Ketchikan.....	1, 012. 00	0	0	0	1, 012. 00
Key West.....	2, 841. 00	95. 19	0	0	2, 936. 19
Marcus Hook (Philadelphia).....	10, 528. 00	23, 726. 52	374. 00	798. 00	35, 426. 52
Mobile.....	3, 774. 00	5, 314. 93	0	0	9, 088. 93
Newbern.....	0	0	0	0	0
New Orleans.....	26, 744. 00	15, 972. 15	349. 50	22. 75	43, 068. 40
Newport.....	85. 00	0	0	0	85. 00
New York.....	45, 878. 00	135, 748. 85	8, 209. 73	28, 105. 75	217, 942. 33
Ogdensburg.....	0	0	0	0	0
Pascagoula.....	62. 00	42. 23	0	0	104. 23
Pensacola.....	1, 017. 00	3, 931. 27	0	0	4, 948. 27
Perth Amboy.....	330. 00	400. 25	0	0	730. 25
Port Angeles.....	90. 00	51. 34	0	0	141. 34
Port Aransas.....	30. 00	0	0	0	30. 00
Port San Luis (Port Harford).....	560. 00	0	0	0	560. 00
Portland.....	1, 473. 66	2, 008. 23	0	0	3, 481. 89
Port Townsend.....	4, 710. 00	5, 524. 63	0	1, 199. 00	11, 433. 63
Porto Rico.....	5, 726. 50	455. 67	0	4. 25	6, 186. 42
Providence.....	1, 396. 00	261. 55	0	0	1, 657. 55
Sabine.....	5, 194. 00	6, 393. 39	0	0	11, 587. 39
St. Andrews.....	206. 00	395. 00	0	0	601. 00
St. George Sound.....	140. 00	0	0	0	140. 00
St. Johns River.....	1, 213. 00	1, 036. 04	0	0	2, 249. 04
San Diego.....	2, 473. 00	16. 41	0	0	2, 489. 41
San Francisco.....	7, 540. 00	41, 176. 95	0	0	48, 716. 95
San Pedro.....	12, 448. 00	407. 77	0	73. 00	12, 928. 77
Savannah.....	1, 207. 00	1, 372. 49	0	0	2, 579. 49
Seattle.....	0	9, 696. 18	0	0	9, 696. 18
South Bend.....	90. 00	8. 00	0	0	98. 00
Tampa Bay.....	3, 005. 00	2, 346. 39	0	0	5, 351. 39
Vineyard Haven.....	0	0	0	0	0
Virgin Islands.....	4, 764. 00	101. 61	0	78. 75	4, 944. 36
Washington, N. C.....	0	0	0	0	0
Total.....	199, 563. 16	328, 174. 64	11, 652. 73	32, 369. 02	571, 759. 55

## TRANSACTIONS AT FOREIGN PORTS

*Summary of transactions at foreign ports*

Ports	Vessels inspected	Vessels fumigated	Passengers and crews inspected	Bills of health counter-signed
Amoy, China.....	63	0	13,900	63
Callao, Peru <sup>1</sup> .....	271	27	28,358	271
Frontera, Mexico.....	129	26	3,408	129
Guantanamo Bay, Cuba.....	88	0	6,922	140
Guayaquil, Ecuador.....	149	0	12,676	172
Habana, Cuba.....	1,785	90	196,600	1,785
Hongkong, China.....	110	0	102,759	584
Progreso, Mexico <sup>2</sup> .....	80	24	3,662	80
Puerto Mexico, Mexico.....	27	16	616	65
Shanghai, China.....	506	128	22,043	589
Tampico, Mexico.....	950	777	30,798	1,935
Tuxpam and Port Lobos, Mexico.....	108	0	3,881	108
Vera Cruz, Mexico.....	295	206	16,064	295
Yokohama, Japan.....	209	17	35,517	269
Total.....	4,770	1,311	477,204	6,485
European ports <sup>3</sup> .....	2,040	722	522,052	6,148
Total.....	6,810	2,033	999,256	12,633

<sup>1</sup> Reports are to Apr. 15, 1924, when station was discontinued.<sup>2</sup> Reports are to Dec. 11, 1923.<sup>3</sup> See table on pp. 159 and 160

## REPORTS FROM FOREIGN PORTS

## SERVICE OPERATIONS IN EUROPE

*Paris, France.*—Asst. Surg. Gen. Rupert Blue in charge until December 5, 1923. Surg. W. W. King in charge since December 5, 1923.

## ORGANIZATION

There has been no radical departure from the form of organization built up during previous years, consisting of a central supervisory office at Paris, France, and Public Health Service officers attached to American consulates at ports where large numbers of passengers embark for the United States or which are important for some other reason. During the year the officer at Trieste, Italy, was withdrawn, thereby closing service operations at that port, on account of the small amount of work. On the other hand, the organization has been extended by the appointment of two acting assistant surgeons, one at Londonderry, Ireland, for the sanitation of passengers from northern Ireland to the United States, and one at Bordeaux, France, for the supervision and certification of the fumigation of vessels bound to United States ports. Steps have been taken to appoint an officer at Glasgow, Scotland. With this appointment the organization will cover every port in Europe from which any considerable number of passengers embark for the United States.

## INSPECTION, ETC., OF PASSENGERS

The activities of the service in Europe have continued along the same lines as in previous years, attention being paid principally to the inspection of passengers of the third class and to those of the same type traveling second class. This inspection is limited strictly

to matters comprehended under the quarantine laws and regulations and deals chiefly with vaccination against smallpox, the presence of vermin on the persons or in the baggage, detection of epidemic communicable diseases, and the measures to be taken when necessary to embark the passengers in proper sanitary condition.

The efficiency of the inspection has been steadily improved as faulty procedures were discovered and corrected or as experience has demonstrated better methods. Improvement is due in part to improved facilities at several ports. The flow of passengers through the ports of embarkation has been very irregular, due to the effects of the restrictive immigration legislation in force. There were periods of great activity as the monthly percentage of the quotas became available, followed by a longer slack-time period. With few exceptions, the number of immigrants permitted under the law embarked during the first half of the year and the heavy steerage travel at certain times severely taxed the facilities at some ports—a situation not conducive to effective performance of the prescribed sanitary measures. The reduction of the monthly quota to 10 per cent by the immigration act of 1924 will automatically cause a more even flow of passengers and a corresponding improvement in the administration of the necessary measures.

The insistence that passengers be in good sanitary condition upon embarkation and the effective enforcement of that requirement have resulted not only in a very marked change for the better in the state in which such passengers arrive at United States ports, but also in a very notable improvement in the state of personal cleanliness in which many passengers of this type present themselves at the port of embarkation. Information upon these matters has traveled back to the countries from which the passengers come, and the moral effect produced has been great enough to extend even beyond the prospective passengers. The notice of public-health authorities, local and national, has been attracted, and attention to public health and sanitation has been stimulated. It has been felt as a stigma that passengers from certain countries should be classed as requiring sanitary treatment, and in some instances passengers of the emigrant type are now required to undergo such treatment before leaving the country. The efforts to improve public health in some countries have been so successful that it will be possible in the near future to modify the requirements in respect to passengers from those countries.

The insistence on cleanliness upon embarkation is not new, but it has been ineffective except when enforced by the presence of representatives of the Public Health Service attached to the American consulates at the chief ports of embarkation. These European stations, coordinated under the direction of the Paris office, have been likened to a first line of defense against the importation of communicable diseases into the United States. Supported by the quarantine service at home ports, the two organizations form a system the value of which has been demonstrated by the results. Undoubtedly the cessation of service operations abroad would result in a lapse into former conditions.

As a general rule it may be said that the sanitary situation has improved during the year, but it is not to be expected that it will become satisfactory in all respects for some years to come. Public-health services are becoming more widely and more effectively organized, diseases are more generally reported and combated, and reports and statistics have become available from more countries now than during the previous year, but efforts to obtain official statistics have not yet been successful in all cases.

*Typhus fever.*—Typhus fever has continued prevalent in Russia, Poland, and Greece, although less so than in previous years. There has been some increase during the spring of 1924 in the numbers of cases reported from Rumania, Hungary, and Yugoslavia, and some small outbreaks in Ireland. Sporadic cases have been reported from other countries, but in general this disease has been decidedly less prevalent in Europe than during any year since the war. Cases have been reported from Palestine, Egypt, Algeria, and Tunisia. The presence of such diseases in the African and Asian Mediterranean countries may properly be considered together with the public-health situation in Europe because much of the travel from those countries to the United States is via European ports.

*Smallpox.*—The incidence of smallpox continues high in Russia, with some improvement in 1924 over the previous year. In England there has been a rather marked increase in the number of cases, although the character of the disease is usually very mild. This type in England is called the "American type." Notwithstanding some periods of increase in various places, there has been a general downward trend in the number of cases in European countries.

*Plague.*—Plague reappeared in Russia in July, 1923, coming from Asiatic Russia, and has continued, particularly in the eastern districts. The disease made its reappearance in Greece in August, 1923, and has continued throughout the year. Plague has been endemic in Egypt, and sporadic cases have occurred in Syria, Tunis, and Algeria. Constantinople has been apparently free from the disease for five months. Three cases occurred at Lisbon, Portugal, in January, 1924, and sporadic cases have occurred at Malaga, Spain. The presence of the disease in the Canary Islands continues to be a direct menace to the United States ports, particularly Porto Rican and Gulf ports.

The periodical fumigations for deratization of vessels bound to the United States has increased during the year, and arrangements were completed with the Scottish Board of Health whereby fumigation certificates issued by the port medical authorities at Glasgow, Greenock, Edinburgh (Leith), Dundee, and Aberdeen would be accepted by quarantine officers at United States ports when complying with the requirements and when countersigned by American consuls. Rodent-control measures have continued in operation at various European ports, particularly at Liverpool, Southampton, Naples, and Marseille.

*Cholera.*—Cholera has not been reported in Europe except 63 cases in Russia during the first half of the year, chiefly from Rostov and the district of the Don.

*Diseases occurring among passengers.*—The following diseases were reported by medical officers as occurring among passengers at ports awaiting embarkation: Antwerp, measles 1; Gothenburg, measles 2;

Hamburg, typhus fever 1; Libau, measles 1, influenza 1, varicella 1; Marseille, measles 4, diphtheria 7, varicella 2.

## MISCELLANEOUS DUTIES OF OFFICERS IN EUROPE

The collection of information in regard to public-health conditions and sanitary measures is an important duty but one often difficult for officers to carry out because of the reluctance of local health officials to give information which may be considered adverse to their interests or the interests of their ports.

Medical officers are called upon by consuls to examine sick American seamen, to make physical examinations of war veterans, pensioners, and seamen, and to advise consuls in medical questions which may arise. These duties have been increasing, particularly at Genoa and Naples, Italy.

## INTERNATIONAL CONFERENCES AND MEDICAL SOCIETIES

While in charge of the Paris office Assistant Surgeon General Blue, as delegate of the United States, attended the semiannual October meeting of the Office Internationale d'Hygiène Publique at Paris. Surgeon General Cumming was the delegate at the April-May meeting.

Surgeon King represented the Public Health Service at the Congress of the Royal Sanitary Institute, held at Hull, England, July 30-August 4, 1923, and at the Congress of the Royal Institute of Public Health, held at Bordeaux, France, June 4-9, 1924.

*Report of service operations in Europe, fiscal year 1924*

Place	Number of passengers inspected	Number of crew inspected	Number of passengers vaccinated	Number of crew vaccinated	Number of passengers deloused	Number of crew deloused	Number of passengers detained	Number of passengers rejected
Antwerp, Belgium	20,764		19,343		13,451		13,436	65
Barcelona, Spain	193	30	30		3			
Bergen, Norway	2,116		2,116					
Bordeaux, France								
Boulogne, France	317		301		208			
Bremen, Germany	57,583		38,336		17,041		13,688	53
Cherbourg, France	49,876		31,830		28,286		22,080	
Christiania, Norway	6,046		6,046		234			6
Constantinople, Turkey <sup>1</sup>	6,521		4,406		5,300			
Copenhagen, Denmark	8,943		8,943		3,397		3,108	
Danzig, Free City	27,045	210	26,338		26,187			164
Genoa, Italy	17,151		16,367		14,370			8
Gothenburg, Sweden	11,341		10,872		683		528	76
Hamburg, Germany	55,287		45,636		20,936		17,806	54
Havre, France	23,772		8,736		5,947		5,381	37
Libau, Latvia	6,997	84	6,240	157	6,195	157		51
Liverpool, England	67,311		37,799		3,912		2	34
London, England	2,794	1	1,860	1	128		8	28
Londonderry, Ireland <sup>2</sup>	3,256	5	358		348		3	1
Marseille, France	1,741		1,245		1,267		13	
Messina, Italy	277	2,118	277		277			
Naples, Italy	60,502	14,582	60,502		60,502			
Palermo, Italy	9,074	3,218	9,074	68	9,074			
Patras, Greece	1,842	4,415	1,541	1,322	1,493	632	1	52
Piræus, Greece	3,561	4,734	3,377	895	3,321		21	44
Queenstown, Ireland	11,032		8,804		5,185		7	
Rotterdam, Netherlands	14,163		5,716		7,828		1,429	
Southampton, England	18,671	2,400	6,201	450	2,278		366	252
Stavanger, Norway	975		718		11		2	
Trieste, Italy <sup>3</sup>	1,104		1,100		1,100			
Total	490,255	31,797	364,112	2,893	238,962	789	80,879	925

<sup>1</sup> Not in operation from Oct. 31, 1923, to Feb. 1, 1924.

<sup>2</sup> In operation since Feb. 1, 1924.

<sup>3</sup> Not in operation since Sept. 8, 1923.

## Report of service operations in Europe, fiscal year 1924—Continued

Place	Number of pieces of baggage disinfected	Number of pieces of baggage inspected without disinfection	Number of vessels fumigated	Number of bills of health countersigned	Number of vessels inspected	Number of medical examinations of service beneficiaries
Antwerp, Belgium	11,345	27,438	16	615	27	5
Barcelona, Spain	265	49	55	151	151	
Bergen, Norway				19		4
Bordeaux, France			6			
Boulogne, France	416	591		39		
Bremen, Germany	21,179	67,150	34	294	39	
Cherbourg, France	59,707	5,874		302		1
Christiania, Norway	254			94		
Constantinople, Turkey	3,273	800		57	28	
Copenhagen, Denmark	1,601	2,973	34	137	28	37
Danzig, Free City	32,497	1,940		41	65	
Genoa, Italy	3,853	10,391	103	337	73	241
Gothenburg, Sweden	852	13,248	1	96	31	
Hamburg, Germany	46,511	52,591	182	664	320	
Havre, France	9,975	742	46	85	23	1
Libau, Latvia	8,897	2,572	4	16	66	
Liverpool, England	2,352	48,027	78	800	169	
London, England	86	243	35	600	15	26
Londonderry, Ireland	6	500		16		3
Marseille, France	2,126	187	49	209	57	
Messina, Italy	127	255	2	72	72	37
Naples, Italy	54,555	25,601	12	237	237	168
Palermo, Italy	3,107	10,515	12	110	110	25
Patras, Greece	2,232	115		36	36	
Pirens, Greece	2,860	1,046		78	78	
Queenstown, Ireland	4,424	3,073		116	94	
Rotterdam, Netherlands	9,374	1,989	37	478		1
Southampton, England	3,115	57,006	12	424	322	4
Stavanger, Norway	5			17		1
Trieste, Italy	100	1,252	4	8		
<b>Total</b>	<b>285,094</b>	<b>336,168</b>	<b>722</b>	<b>6,148</b>	<b>2,040</b>	<b>554</b>

## FRONTERA, MEXICO

Acting Asst. Surg. C. E. Athey in charge.

The work of the International Health Board in conducting a campaign against yellow fever and the propagation of *Aedes ægypti* mosquitoes has been discontinued. At the close of the work, Frontera was well cleaned of *Aedes* mosquitoes.

## QUAYAQUIL, ECUADOR

Acting Asst. Surg. Carlos V. Coello in charge.

**Plague.**—One hundred and eighty-eight cases of plague with 56 deaths were reported. If the measures enforced by the local public-health service can not eradicate the epidemic from the country, an enterprise difficult to accomplish on account of several adverse local factors, they can at least keep the disease under control and cause a certain decrease as compared with the past years.

A change in the system of construction, avoiding the double walls and ceiling, for the purpose of building the rats out, is actively enforced. The use of cement with solid walls is gradually supplanting the old wooden construction.

According to official information, 385,560 rats were trapped during the year, 1,050 of which were found to be infected with *Bacillus pestis*.

During July, August, and October, 1923, plague appeared in some of the mountain towns, where 20 cases with 9 deaths were reported.



On the other hand, Manta and Bahia, ports on the north coast of Ecuador, 603 and 583 miles from Balboa, Canal Zone, respectively, have not reported a human case since 1914.

*Smallpox*.—Six cases of smallpox with one death have been officially reported. On April 26, 1924, the German steamship *Nitokris*, bound from Valparaiso to Europe, via the Panama Canal, arrived at Guayaquil with two cases of smallpox on board. The vessel was detained, all on board were vaccinated, and the fact was reported to the health authorities of the Canal Zone.

As in former years, vaccination is carried out extensively and isolation of cases is strictly enforced. This has caused a marked diminution of cases as the following table indicates:

Calendar year—	Cases	Deaths	Remarks
1920.....	50	3	Guayaquil and vicinity.
1921.....	176	1	
1922.....	58	0	
1923.....	19	0	
First half 1924.....	5	1	Imported from Chile.

Recent anti-smallpox vaccination is required of passengers booked to pass through the Panama Canal or for the west coast of the United States.

*Leprosy*.—It is believed that about 10 cases of leprosy are present in the city.

*Icterohemorrhagic fever*.—No new case of this disease has been reported.

*Yellow fever*.—Although the last case of yellow fever in Guayaquil was reported in May, 1919, measures for the purpose of keeping down the *Aedes ægypti* index are still being carried out by the local health officers.

#### GENERAL MORTALITY

The total number of deaths in Guayaquil during the calendar year 1923 was 4,474, an increase of 784 over the previous year, and which, with an estimated population of 110,000, gives a death rate of 40.67 per thousand.

#### QUARANTINE RESTRICTIONS

The closing of the Callao station has imposed upon this station a certain amount of new work and responsibility. For the protection of the Canal Zone, transit passengers, who formerly were only inspected, are now required to fulfill the same conditions as those embarking at Guayaquil.

#### HABANA, CUBA

Acting Asst. Surg. Richard Wilson in charge.

The work of this office in brief is as follows: (1) To issue bills of health, in connection with the office of the consul general, to the vessels going to the United States and its dependencies, either direct or via foreign ports, these bills of health to be delivered at the last moment after all the requirements have been complied with; (2) to make a weekly report of the transactions of this office; (3) to report the sanitary condition of the city and port, and if possible of the

surrounding country: (4) to fumigate vessels when necessary; (5) to inspect vessels, cargoes, crews, and passengers when necessary; (6) to examine American seamen that are sick enough to be sent to a hospital, and to report to the consul general, recommending action to be taken.

In the last annual report it was stated that the office would have to be moved soon to the new building, but no notice to move has been received. Neither has the Cuban immigration department been moved or notified, although the new pier and part of the new building, called Santa Clara, have been in use for about one year.

Repairs to the furniture and other office repairs were completed, improving the appearance of the office.

## FUMIGATION

For several years for purposes of fumigation, vessels have been divided into three classes, as follows:

First. Vessels fumigated by the service. This class includes vessels usually going direct to the United States or its dependencies; fumigated to comply with the quarantine regulations of the service.

Second. Vessels fumigated by the Cuban quarantine under the supervision of the service. These are vessels that require fumigation by the Cuban quarantine regulations, and intend going later to the United States, usually via Cuban ports. At the request of the ship's agents, the service fumigator goes on board to inspect the fumigation, and if it is done in accordance with the service regulations, he so reports and a certificate is issued.

Third. Vessels recommended for fumigation at a United States port, either on arrival or when empty, according to circumstances. These are vessels in transit with more or less cargo or passengers on board, on which account fumigation here was not advisable.

As the conditions for which fumigation was required in Habana have disappeared, the fumigations have decreased steadily for several years.

TABLE 1.—Comparison of the work of the last five years

	1919-20	1920-21	1921-22	1922-23	1923-24
Numbers of vessels, passengers, etc.:					
Vessels going direct.....	1,842	2,222	1,973	885	1,017
Vessels going via foreign ports.....	567	609	714	846	768
Total bills of health issued.....	2,409	2,831	1,1,687	1,731	1,785
Total members of crews.....	116,071	143,800	107,597	108,697	119,995
Total passengers.....	62,461	80,377	58,880	67,075	76,605
Passengers for the United States and its dependencies (included above).....	57,838	54,055	41,785	53,240	62,648
Fumigations:					
Vessels fumigated by the Service.....	22	27	21	23	21
Vessels fumigated by the Cuban quarantine under the supervision of the service.....	188	219	152	51	69
Vessels recommended for fumigation at a United States port.....	0	0	1	1	0
Sick seamen:					
Sent to a hospital at Habana.....	106	51	7	3	2
Treated in office or on board.....	602	163	17	22	38
Total sick seamen.....	708	214	24	25	40
Total visits.....	818	221	25	27	40
Certificates issued.....	210	136	9	16	25

<sup>1</sup> Diminution caused by amendment No. 3 of United States Quarantine Regulations, dated July 20, 1921.

<sup>2</sup> Discontinued Feb. 2, 1923.

<sup>3</sup> Began again Sept. 12, 1923.

TABLE 2.—*Comparison of the work of 1924 with that of 1923*

	1922-23	1923-24	Increase or decrease in 1924
Vessels going direct.....	885	1,017	+132
Vessels going via foreign ports.....	846	768	-78
Total bills of health issued.....	1,731	1,785	+54
Members of crews on vessels going direct.....	63,547	72,784	+9,237
Members of crews on vessels going via foreign ports.....	45,151	47,211	+2,060
Total members of crews.....	108,697	119,995	+11,298
Passengers embarking in Habana.....	42,769	41,387	-1,382
Passengers in transit.....	24,306	35,218	+10,912
Total passengers.....	67,075	76,605	+9,530
Passengers for the United States and its dependencies (included in the above).....	53,240	62,648	+9,408
Vaccination certificates.....	0	0	0
Vessels fumigated by the service.....	23	21	-2
Vessels fumigated by the Cuban quarantine under the supervision of the service.....	<sup>1</sup> 51	<sup>2</sup> 69	+18
Vessels recommended for fumigation at a United States port.....	1	0	-1
Sick seamen sent to a hospital at Habana.....	3	2	-1
Sick seamen treated in office or on board.....	22	38	+16
Total sick seamen.....	25	40	+15
Total visits.....	27	40	+13
Certificates issued.....	16	25	+9

<sup>1</sup> Discontinued Feb. 2, 1923.<sup>2</sup> Began again September, 1923.TABLE 3.—*Principal transmissible diseases reported in Habana City during the fiscal year 1923-24*

Disease	July-December, 1923		January-June, 1924		Total fiscal year, 1923-24	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Typhoid fever.....	221	44	349	51	570	95
Paratyphoid fever.....	9	1	14	1	23	2
Typhus exanthematic.....	0	0	0	0	0	0
Malaria.....	784	16	266	5	1,050	21
Diphtheria.....	69	11	106	3	175	14
Scarlet fever.....	18	0	20	1	38	1
Measles.....	31	0	129	1	160	1
Chicken pox.....	19	0	374	1	393	1
Smallpox.....	0	0	0	0	0	0
Cerebrospinal meningitis.....	0	0	6	1	6	1
Leprosy.....	10	1	3	1	13	2
Yellow fever.....	0	0	0	0	0	0
Poliomyelitis.....	1	0	0	0	1	0
Icterus gravis.....	0	0	0	0	0	0
Tetanus, infantile.....	1	1	0	0	1	1
Rabies.....	1	1	0	0	1	1

The deaths are included in the number of cases.

## PROGRESO, YUCATAN, MEXICO

Acting Asst. Surg. H. E. Gimler in charge from June 30 to December 12, 1923. The quarantine work performed at this station consisted in the inspection of passengers and crews embarking from this port for ports in the United States. Vessels sailing for southern ports in the United States from this port during the close quarantine season were fumigated for the destruction of mosquitoes.

A semimonthly report was submitted regarding the prevalence of *Aedes ægypti*, the work for the extermination of mosquitos, and the weather conditions.

No case of yellow fever was reported in this district.

## PUERTO MEXICO, MEXICO

Acting Asst. Surg. J. J. Sparks in charge.

The movement of troops from all of the surrounding States—Tabasco, Chiapas, Oaxaca, and Yucatan—where yellow fever had

prevailed more or less all the time, has demonstrated quite clearly the good work done by the international health board in the control of yellow fever and malaria.

There is very little being done this season to control the breeding of mosquitoes. The local authorities are doing a little toward oiling the pools of water, etc., but they say they have no money to carry on the work extensively.

#### SHANGHAI, CHINA

Acting Asst. Surg. S. A. Ransom in charge.

The outstanding feature relating to the public health of the international settlement during the year July, 1923, to June, 1924, was an increase of 41 cases in the reported incidence of smallpox among foreigners and an increase of 97 deaths among natives. It will be understood, of course, that since there is no compulsory report of morbidity or mortality in force in this settlement the figures quoted probably do not include the total increase in this disease which occurred during the period covered by the report.

There were vaccinated by various local and ships' surgeons 106 passengers and 4,765 members of crews destined to ports in America and its dependencies.

Of the cases of illness investigated on board vessels, one proved to be hemorrhagic smallpox, one leprosy, and one scarlet fever. Appropriate measures were taken in each instance for protection of the vessels and their personnel from infection.

The disinfecting work performed has, as heretofore, been done by the floating plant of a private company under the supervision of this office.

#### TAMPICO, MEXICO

Surg. (R.) Fleetwood Gruver in charge.

The general health conditions of Tampico, except from a quarantine standpoint, have not improved during the year. There has been no yellow fever nor human plague reported within that time.

Smallpox was introduced in January, 1924, by troops from the interior, and the infection still remains. Although yellow fever, plague, and other epidemic diseases are not prevalent, the death rate increased over that of the previous year from an annual rate of over 30 to over 34 per 1,000 population (based on a population of 80,000).

*Yellow fever and antimosquito work.*—No case of yellow fever has been reported from Tampico or anywhere in Mexico during the year. One suspected case of yellow fever was reported in December, but the diagnosis was not confirmed.

The antimosquito work under the direction of the Rockefeller Yellow Fever Commission was turned over to the local authorities in November, 1923. The work was suspended till the early part of 1924, when it was broadened in scope and made general in character, without special reference to *Aedes ægypti*, to include house-to-house inspections in the course of general or routine antimalaria work. The report for the 15 days ended June 30, 1924, showed a generally higher house breeder index than at any time within the past two years.

*Plague.*—No case of plague has been reported during the year. The last case was reported March 15, 1923; and the last rodent plague September 17, 1923. Rodent eradication continues.

*Inspection of vessels.*—During the year 2,396 vessels were cleared through the American consulate, as compared to 2,194 the preceding year. Of this number, 1,534 went to southern ports and required inspection. Seven hundred and seventy-seven vessels were fumigated for the destruction of mosquitoes or rodents, or for both. No case of a quarantinable disease occurred on board a vessel.

A gratifying change is distinctly noticeable in the attitude of steamship personnel and shipping companies toward the proper rat guarding and fending off of vessels. Companies which have formerly insisted that to properly rat guard and fend off was an impossibility in this port now rarely have a vessel to fumigate because of faulty technique. One company in particular, whose vessels were the most constant delinquents, has made the masters of its vessels understand that they would be financially responsible for any fumigation made necessary because of careless rat guarding. The vessels of this company are now models in this respect.

*Fumigation.*—The arrangement established, at the suggestion of the bureau, between the several companies and the fumigators, whereby so great a saving in the cost of fumigations was made during the last quarantine season, continues in force. Vessels fumigate here now at no greater cost than they do in United States ports. Of the fumigations done during the past fiscal year, 247 were performed at the request of agents of vessels not subject to fumigation here who elected to have the routine six months' fumigation done at this port.

#### TUXPAM, MEXICO

Acting Asst. Surg. L. M. Taylor in charge.

Located midway between Tampico and Vera Cruz, State of Vera Cruz, Mexico, this district exports nothing to the United States except petroleum, chicle, and vanilla. All vessels are loaded 1 mile at sea. There is seldom any communication with shore by members of the crew, and when this occurs it is noted on the bill of health for the information of the service officer at the port of entry in the United States. No passengers are carried from here. With the exception of two instances, fumigation has been considered unnecessary during the year.

Duties of the local officer consist of inspecting crews of vessels bound for southern United States ports and reporting on health and sanitary conditions, including the mosquito situation.

#### VERA CRUZ, MEXICO

Acting Asst. Surg. Percy Ahrons in charge from July to December, 12, 1923.

The work at this station consists in the inspection of crews and passengers embarking for ports in the United States. Vessels sailing for ports in the United States are fumigated for the destruction of mosquitoes also, in case the destination is a southern port in the United States.

No cases of yellow fever or human or rodent plague were reported.

The Mexican Federal Health Department are carrying out effective measures for the destruction of rats and mosquitoes.

Sanitary conditions in the city are fair.

There have been a few cases of smallpox reported, mostly among the soldiers.

## YOKAHAMA, JAPAN

Passed Asst. Surg. Vance B. Murray in charge.

The earthquake that devastated Yokohama occurred September 1, 1923, at 11.58 a. m., and in the fire that followed all bills of health were destroyed.

The first bill of health issued after the fire was typewritten on blank paper and composed from memory by Vice Consul Leo Sturgeon (the consul general had been burned to death). This was issued to the Shinyo Maru, September 17, 1923, and was not countersigned by a medical officer.

The weekly health reports for the municipality were resumed October 1, 1923.

C. W. Cummings, major, M. C., United States Army, performed the duties of medical officer for the United States Public Health Service and countersigned bills of health from October 19 to December 30, 1923; Surg. E. W. Scott, January 17 to February 16, 1924; and Passed Asst. Surg. V. B. Murray, May 2 to June 17, 1924.

During the week ending June 15, 1924, an unprecedented number of Japanese ships made special trips to enable emigrants to arrive in the United States prior to July 1, the effective date of the new immigration act of 1924.

## SUMMARY OF QUARANTINE TRANSACTIONS

*Summary of quarantine transactions at continental and insular stations and foreign ports for the fiscal year ended June 30, 1924*

Stations	Vessels inspected	Vessels fumigated	Passengers and crews inspected	Bills of health issued or countersigned
Continental.....	19,309	4,896	<sup>1</sup> 1,994,235	0
Insular.....	3,048	414	340,021	4,578
Foreign.....	6,810	2,033	999,256	12,633
Total.....	29,167	7,343	3,333,512	17,211

<sup>1</sup> Maritime stations, 1,914,075; border stations, 80,160. Statistics do not include "local" travelers at border stations, numbering 4,607,648, who, however, were given cursory inspection.

## MEDICAL INSPECTION OF ALIENS

During the fiscal year ended June 30, 1924, there were examined by medical officers of the United States Public Health Service 938,928 alien passengers for the purpose of detecting physical or mental defects or diseases, as provided for in the United States immigration laws, as compared with 745,515 for the fiscal year ended June 30, 1923, 586,228 for the fiscal year ended June 30, 1922, and 1,137,682 for the fiscal year ended June 30, 1921. In addition to the passengers examined, 874,962 alien seamen were inspected, as provided for in the act of February 5, 1917, as compared with 826,295 for the fiscal year ended June 30, 1923, 783,193 for the fiscal year ended June 30, 1922, and 851,928 for the fiscal year ended June 30, 1921. The reduction in the number of alien passengers examined in 1922 and subsequent years from that in 1921 was largely due to the application of the "3 per centum law." The accompanying tables present in detail the data relative to the inspection and certification of alien passengers and alien seamen during the fiscal year under report.

*Alien seamen inspected and certified at all ports and places in the United States and its dependencies and in Canada*

[illegible]

Alien seamen inspected and certified at all ports and places in the United States and its dependencies and in Canada—Continued

Place	Number of alien seamen examined	Alien seamen certified				Important diseases for which certification was made												
		Class A		Class B: Disease or defect which affects ability to earn living	Class C: Disease or defect of less degree	Total	Idiocy, imbecility, feeble-minded, mentally defective	Epilepsy	Insanity	Psychopathic inferiority	Chronic alcoholism	Tuberculosis	Trachoma	Favus	Syphilis	Soft chancre	Gonorrhea	
		(1) Idiocy, imbecility, feeble-minded, insanity, mentally defective, epileptic, syphilitic, chronic alcoholism	(2) Loathsome contagious diseases															
Fall River, Mass.	2,003	7	1	8	16													
Fort Monroe, Va.	24,165	8	83	38	293			1				7			2	16	70	5
Freeport, Tex.	1,706		1		1													78
Galveston, Tex.	17,611	2	90		203		1					1	15		33	10		53
Gloucester, Mass.	312	1	1	2	4													1
Hallifax, Nova Scotia	0																	
Hidalgo, Tex.	0																	
Honolulu, Hawaii	10	4	1		5												1	2
Honolulu, Wash.	2,770	18	1		19								3		1	10	4	
Houlton, Me.	0																	
International Falls, Minn.	0																	
Jackman, Me.	0																	
Ketchikan, Alaska	0																	
Key West, Fla.	3,671	1	5		6							1				1		4
Laredo, Tex.	0																	
Lewiston, N. Y.	0																	
Mareus, Wash.	0																	
Mobile, Ala.	5,864	29	28	6	63													
Montreal, Canada	130	2	3	4	9											12	4	13
Naco, Ariz.	0																	
New Orleans, La. (city)	4,619	4	4	13	46		4											
New Orleans, La. (quarantine)	50,446	1	2	3	55							1	2		12	4	1	6
Newport, Vt.	0																	
New York, N. Y.	473,520	7	110	24	148				2			5	15		21	19		55



[illegible]

42 cases of clonorchiasis certified at San Francisco, Calif.



[illegible]

† I case of leprosy certified at Montreal, Canada.

3 1 case of leprosy certified at Montreal, Canada.  
4 6 cases of gonorrhoea and 1 case of leprosy certified at New York, N. Y.

<sup>1</sup> 22 cases of clonorchiasis certified at Boston, Mass.  
<sup>2</sup> 11 cases of clonorchiasis certified at Honolulu, Hawaii.

22 cases of clonorchiasis certified at Boston, Mass.

*Alien passengers inspected and certified at all ports and places in the United States and its dependencies and in Canada—Continued*

Place	Number of alien passengers examined	Alien passengers certified		Important diseases for which certification was made												
		Class A		Total	Idiocy, imbecility, feeble-minded, mentally defective	Epilepsy	Insanity	Psychopathic inferiority	Chronic alcoholism	Tuberculosis	Trachoma	Favus	Syphilis	Soft chancre	Gonorrhea	
		(1) Idiocy, imbecility, feeble-minded, insane, some mentally defective, epileptic, syphilitic, contagious diseases	(2) Loathsome, contagious or less dangerous to earn living													
San Fernando, Ariz.....	204	1	1	3												
San Francisco, Calif. <sup>5</sup> .....	16,838	4	103	589	2		2				1	2			1	4
San Juan, P. R.....	3,204	1		11							1					
San Pedro, Calif. <sup>6</sup> .....	3,142	3	1	7				1			2				2	
Sault Ste. Marie, Mich.....	2,311	8	4	37				1	4		3					
Savannah, Ga.....	44															
Seattle, Wash. <sup>7</sup> .....	4,030	14	200	584				1	7		6	6	1	6	13	14
Sumas, Wash.....	776	7	10	131				2	4		1	2			8	
Sweet Grass, Mont.....	725															
Tacoma, Wash.....	87	3		7			1				1					
Tampa, Fla.....	2,617	1	5	10				1								
Tampa Bay, Fla. (quarantine).....	3,389															
Tia Juana, Calif.....	3,133	7	15	44			2		2		3	11		1		3
Tucson, Ariz.....	258	13	47	68				3	5	3	2	9				22
Van Buren, Mo.....	91	1		17									15			
Vancouver, British Columbia.....	5,067	19	15	250			2	3	4	5	5	6	4		2	5
Victoria, British Columbia.....	5,968	7	2	86				2		1	4					
Wilmington, N. C.....	0															
Winnipeg, Canada.....	21,596	21	4	916			1	2		2	1	3	1			
Yarmouth, Nova Scotia.....	25,688	8		306			1	1	1	3	2					
Total.....	938,928	728	2,372	34,403	214	52	89	144	4	226	1,190	30	101	79		292

<sup>5</sup> 96 cases of clonorchiasis certified at San Francisco, Calif.

<sup>6</sup> 1 case of leprosy certified at San Pedro, Calif.

<sup>7</sup> 160 cases of clonorchiasis certified at Seattle, Wash.

## REPORTS FROM IMMIGRATION STATIONS

## AJ0, ARIZ.

A. A. Surg. O. B. Patton in charge.

The majority of aliens examined at this office are Mexicans from the rural districts of Sonora, Mexico, where little opportunity for the spreading of acute infectious diseases exists.

## ASTORIA, OREG.

Surg. H. M. Manning in charge.

During the year alien crews were subject to inspection at the request of the Immigration Service, the same as during the previous fiscal year. Because of the increase in the number of vessels entering this port during the past year there has been a considerable increase in the number certified under the immigration laws.

## BOSTON, MASS.

In addition to the regular steamers calling at this port, a number of ships were diverted from New York during the rush of the summer and fall season. At one time over 7,000 passengers arrived within 48 hours, but with the assistance of service medical officers on other duty in Boston the situation was met promptly and no delays occurred.

Assistant Secretary Wadsworth and the Surgeon General visited the station in October and several problems were discussed in detail. Following their suggestions conferences were held during the winter with transportation and dock representatives with a view to securing better facilities on the piers for more intensive examination. Owing to the uncertain effect of new immigration legislation the parties upon whom expense would fall have withheld action until they can decide whether the results to themselves would justify necessary alterations. It is believed that favorable action will be taken because it is more than likely that Boston will become a port of call for the majority of large local passenger carriers; hence, to expedite the departure of ships, pier facilities will have to be rearranged to meet the new conditions.

There has been so much discussion in recent years concerning the number, or percentage, of inmates of various public hospitals that could have been detected at times of arrival, that an attempt was made to find out how many Boston arrivals were committed to Massachusetts institutions within a year following admission. In spare time an attempt was also made to find out what happened to the alien after landing and the diagnosis made by the hospital staff. July 1, 1923, was the date used as a starting point; the local immigration records and the superintendents of State institutions were used as sources of information. The object was not only to see how far the criticism was justified but, if possible, to improve the present system of inspection. From such information as could be obtained ability to evade detection at time of entrance is not as prevalent as has commonly been assumed. One institution with over 2,000 inmates, with a percentage of foreign born of between 40 and 50, had no inmates of less than six years residence who had come through

Boston. If this problem can be followed up, information of real value may be obtained. The limitations of this procedure are realized, but it is believed that if arrangements could be made by which an officer would have travel authority to visit State institutions and secure cooperation more cases would be disclosed. The results obtained so far seem to justify the local method of inspection and point out the need of more intensive examination, plus better detention facilities. Aliens who were admitted at Boston and became residents of other States are naturally lost sight of under present conditions.

Four hundred and twenty-five Chinese applied at this station for admission. Of these, 177 were presented for examination. This small proportion was due to the fact that the majority applied as exempts, and since an intensive examination was put into effect, the number of nonexempts has rapidly decreased. During the month of May the immigration officials presented for examination all Chinese whose exempt status was not clearly defined on the day of arrival. This caused a distinct increase in the number of cases certified for clonorchiasis and hookworm infection. If they were landed the immigration office notified the health officer of the community to which they were destined relative to their condition. Twenty-two clonorchiasis, 58 uncinariasis, 28 *Ascaris lumbricoides*, 10 *trichiurus*, and 3 tapeworm infections were certified.

One of the functions of the Service has been the rendering of opinions relative to age. These opinions have been based on physical appearance. Considering the amount of parasitic infection, with its constitutional effects, age estimates based on physical condition solely are of little value. X-ray plates showing the union of bone epiphyses and processes, or centers of ossification, in the absence of bone defects caused by rachitis, syphilis, etc., are likely to be accepted as medico-legal evidence. Hence it has been recommended to the Commissioner of Immigration that provision be made to supply plates of both known ages and ages in dispute of the same race for comparison.

Seventy-four seamen were certified for trachoma and 146 for various venereal infections. The majority were cared for at the local marine hospital. The others were returned to their respective ships to be cared for by the ship's surgeons until the American port of destination was reached.

A new problem arose in the disposition of diseased alien seamen on American ships. In May the Immigration Bureau issued instructions that, for the time being, alien seamen employed on vessels of American registry were not to be considered as alien seamen for the purposes of the act that provides for treatment in hospital of diseased alien seamen. In view of this, the local procedure has been to examine all seamen presented by the immigration inspectors for such purposes on American ships in the same manner as on foreign vessels and to supply the inspector with either a certificate or a medical incomplete memorandum. The inspector informs the master of the benefit to be derived by all concerned in having the afflicted seamen take advantage of his opportunity as a beneficiary of the marine hospital.

One hundred and eighteen stowaways, including one female, were presented for examination, of whom 15 were certified for physical defect.

Four hundred and sixty-six aliens were admitted to appropriate local hospitals for care, or observation for diagnosis. Four deaths occurred, due to the following causes: Miliary tuberculosis, 1; cardio-renal disease, 1; pernicious anemia, 1; and diphtheria, 1. Eighteen detained aliens were recommended for dental treatment.

One hundred and seventy-eight aliens were inspected for the purpose of legalizing their entry into the United States via the Canadian border. Of these, 43 were certified for various physical defects.

General conditions relative to location and lay out of the building remain as reported previously. A detailed report with recommendations has been submitted for the information of the bureau. Approximately 1,100 treatments for minor defects were given in the small dispensary to detained aliens and employees of the Immigration Service. Under the present system of admitting to the one detention room for each sex, any unusual number of immigrants, mild infections soon manifest themselves and proceed to take on epidemic form. For example, 130 persons were brought from Providence, R. I., and placed in the detention quarters. Within three days two cases of diphtheria developed. Cultures from the detained aliens showed seven carriers of Klebs-Loeffler bacilli, all of whom had arrived on the same vessel. In a station of this sort there should be accommodations and facilities to minimize this risk. In a number of instances infected throats have practically assumed epidemic proportions, although prompt control prevented serious results.

As Boston is a district headquarters, the usual inspection of aliens has been continued at the request of the immigration officials at the various subports in the district.

The society in charge of the Immigrants' Home, East Boston, donated a box of toys, and their gift is appreciated as a valuable aid in testing the mentality of children.

It is hoped that the recommendations made relative to the new personnel classification act may be approved in return for faithful services rendered by the local station staff.

#### BROWNSVILLE, TEX.

Acting Asst. Surg. G. D. Fairbanks in charge.

A considerable number of aliens who had entered illegally and been apprehended by the Immigration Service were examined. Most of the aliens certified were found to be affected with some form of eye disease. An unusual number of cases of cataract was observed.

#### CALEXICO, CALIF.

Acting Asst. Surg. A. L. Rice in charge.

The immigrants passing through this port consist of Mexicans, Chinese, and Japanese.

#### DOUGLAS, ARIZ.

Acting Asst. Surg. E. W. Adamson in charge.

Douglas, Ariz., being a port of entry for a portion of the State of Sonora, Mexico, and the terminus of the Nacozari Railroad, has a considerable number of aliens applying for temporary admission, principally for trade purposes. These aliens are almost entirely Mexicans and of a fairly good type.

Since August, 1923, all aliens applying have been vaccinated as a matter of routine unless they presented evidence of immunity to smallpox. The majority have been vaccinated prior to arrival, as the surgeons of the various mining companies have looked well to this preventive measure. Trachoma is the only excludable disease which is endemic, and all of the cases presenting here come from one district.

#### EL PASO, TEX.

Passed Asst. Surg. J. W. Tappan in charge.

Immigration at this port, as heretofore, has been chiefly Mexican, and it is interesting to note that, owing to the quota law limiting immigration at the larger ports of entry, this station has taken second place in the number of aliens entering the United States.

All applicants are closely examined, and, in general, the types of disease presented and the variation in the percentage of those afflicted with certain diseases have not differed materially from those of former years.

Aliens held in detention at the immigration station are given medical attention and general hygienic supervision. It is the custom to require them to be bathed weekly and have their clothing and bedding disinfected at the quarantine station.

#### NACO, ARIZ.

Acting Asst. Surg. B. C. Tarbell in charge.

Immigration into the port of Naco, which is mostly Mexican, was usually heavy during the past year. This was due to the passing through, in transit, of over 1,500 Mexican soldiers who were allowed this privilege by the State Department. These soldiers were subject to the rules and regulations governing other aliens applying for admission.

#### NEW ORLEANS, LA.

Surg. W. C. Rucker in charge.

The class of alien passengers coming through this port is about the average for the past few years, mostly people on business and pleasure from the tropics and an occasional family group of immigrants. Restriction of immigration has practically excluded the immigrant alien so far as this port is concerned.

Sailors continue to protest against being detained at the immigration station on account of its being used also as a detention barracks for the Department of Justice warrant cases and other prisoners held awaiting deportation. They refer to the station as a "bull pen."

Attention has been invited in the past to the inadequate hospital equipment. The wards for hospital cases are decidedly limited, as to number of beds and space, making it necessary to use the detention barracks for most of the cases, where the men sleep in tiers of cots, against which they constantly complain. The quarters have never been overhauled since the building was opened in 1913, and are decidedly insanitary. A thorough renovation is badly needed, and the construction of a separate building for the housing of these cases is a necessity.

In addition to their quarantine duties, the medical officers of the New Orleans quarantine station make medical inspections of alien



passengers and alien seamen entering quarantine. Two immigration officers are domiciled at the quarantine station. These officers accompany the boarding officers, and, after the quarantine inspection has been completed, designate aliens to be medically examined.

Extensive examinations are not attempted, since such would entail unwarranted detention of vessels. In consequence, suspected cases of disease or defect are usually certified to the immigration officers as suspicious, with the notation that the medical examination is incomplete. Such cases are sent to the immigration station in New Orleans, where a complete medical examination is made by the Public Health Service officer attached thereto.

#### NEW YORK, N. Y.

Surg. W. C. Billings in charge.

During the third year of the operation of the so-called 3 per cent quota law 50,181 more alien passengers and 14,864 more alien seamen were medically inspected at this station than were so inspected during the fiscal year 1923. Broadly speaking, the types of disease encountered varied but little from those presented last year, but in one instance a well-marked case of leprosy was picked out of the second cabin by the medical boarding officer.

The same administrative difficulty, but not to such a marked extent has been experienced this year as last in the crowding into the first part of each month and into the first months of the year an undue proportion of the work of each month and of the whole year. The result has been the same as previously experienced, namely, overwork for the personnel during the first part of the month and insufficient work to keep them advantageously employed during the latter part. It is a difficulty which it has been impossible to avoid because the personnel must have a specialized knowledge, attained only after months of training, and can not be increased or reduced every two weeks, depending upon the exact number of arrivals. The Immigration Service experiences the same difficulty and they too have found no satisfactory solution.

It is hoped that the new law, which will be operative for the first time during the ensuing year, will result in a more equable flow of arrivals. This, however, is only a hope, because, as yet, there is no precedent upon which to found a definite opinion.

During the last fiscal year intensive examinations have been given to a larger number of arrivals than during the preceding year. It is interesting to observe, although easy to explain, that the percentage of certified arrivals from year to year bears an inverse proportion to the total number of immigrants examined. In other words, as the total to be examined diminishes, the percentage of certified cases increases. The explanation lies in the fact that, regardless of the number of aliens examined, the number of medical examiners remains a fairly constant quantity, as does also the time at their disposal for the examinations, and, proportionately as the number of arrivals diminishes, more time is available for the examination of each person. This increase in time at the disposal of the examiner has a direct relation to the examination he is able to make, hence the more time the better the examination and, therefore, the greater number of physical or mental undesirabilities discovered. This is the reason

why it is expected that the ensuing year will, under the new 2 per cent law, show a greater percentage of physically objectionable persons discovered by the medical officers than has ever before been possible. This expectation is, of course, predicated upon the assumption that the number of medical officers on line inspection duty will remain the same as at present.

The chief medical officer desires to repeat the opinion expressed in the report of 1923 that the value of intensive examination over the routine method can not be too strongly emphasized, and to obtain the best results the station should be kept supplied with sufficient personnel and sufficient properly designed examining rooms to permit the application of this method to all arrivals.

As a result of precautions exercised before departure, the percentage of arrivals presenting themselves at Ellis Island with pediculosis has been very small, with a corresponding diminution in danger from typhus fever.

In the boarding section of the station the plan of assigning two medical officers to the quarantine station to inspect the crews of nonpassenger-carrying ships has been continued. This is an arrangement that does not have the enthusiastic approval of the chief medical officer.

The hospital section of the station has continued to be operated as United States Marine Hospital No. 43, and in all matters connected therewith the Immigration Service has, as far as possible, extended hearty cooperation.

In the matter of the physical condition of the station, both in regard to upkeep and new construction, much that it was hoped might be accomplished during the year has not materialized.

*Nativity and sex of immigrants admitted to hospital during fiscal year ending June 30, 1924*

Nativity	Adult		Children		Total
	Men	Women	Male	Female	
Africa.....	1				1
Albania.....	11	3			14
Arabia.....	12	8		2	22
Argentina.....	6	4	5	5	20
Armenia.....	50	59	29	11	149
Austria.....	91	31	10	12	144
Australia.....	2				2
Belgium.....	15	9	1	6	31
Bolivia.....	2				2
Bohemia.....	2	3			5
Brazil.....	38	9	6	9	62
British East Indies.....	12				12
British West Indies.....	195	172	22	19	408
Bulgaria.....	19	7	4	2	32
Canada.....	8	9	1	4	22
Chile.....	13				13
China.....	141	3	1		145
Columbia.....	5				5
Croatia.....	1	1		1	3
Cuba.....	23	2	3	2	30
Cyprus.....	1				1
Czechoslovakia.....	138	94	39	37	308
Denmark.....	59	23	7	8	97
Dutch West Indies.....	1				1
Ecuador.....	1	1			2
Egypt.....	4		1		5
Estonia.....	18	7	2	3	30
Finland.....	27	21	4	5	57
France.....	46	25	4	6	81
Germany.....	550	245	65	62	922

*Nativity and sex of immigrants admitted to hospital during fiscal year ending June 30, 1924—Continued*

Nativity	Adult		Children		Total
	Men	Women	Male	Female	
Greece.....	118	44	13	11	186
Guatemala.....	1				1
Holland.....	48	8	10	13	79
Hungary.....	76	79	34	24	213
Iceland.....	1				1
Italy.....	1,478	440	227	223	2,368
Japan.....	5				5
Java.....	1				1
Latvia.....	13	7		1	21
Liberia.....	1				1
Lithuania.....	43	51	21	15	130
Macedonia.....	3	1			4
Malta.....	8			1	9
Mexico.....	15				15
Montenegro.....	2				2
Newfoundland.....		1	2	1	4
Nicaragua.....	2	1			3
Norway.....	119	23	9	9	160
Panama.....	5				5
Palestine.....	16	5		5	26
Persia.....	5				5
Peru.....	3				3
Poland.....	418	284	160	123	985
Porto Rico.....	3				3
Portugal.....	78	27	8	13	126
Rumania.....	102	87	26	29	244
Russia.....	339	385	193	178	1,095
San Domingo.....	2	2			4
Serbia.....	9	5	2		16
South America.....	1	2	3	1	7
Spain.....	166	29	10	13	218
Sweden.....	109	48	17	15	189
Switzerland.....	23	7	2	1	33
Syria.....	39	23	3	10	75
Turkey.....	78	46	24	14	162
Ukraine.....	5	1			6
United Kingdom.....	385	228	52	43	708
United States—born.....	28	11	68	68	175
Uruguay.....	2				2
Venezuela.....	9	2	3		14
Yugoslavia.....	100	55	10	14	179
Not specified.....	110	47	8	11	176
Total.....	5,461	2,685	1,109	1,030	10,285

*Record of boarding divisions*

Month	Barge office				Quarantine				City Island			
	Ships	Passengers	Crew	Total	Ships	Passengers	Crew	Total	Ships	Passengers	Crew	Total
1923												
July.....	175	23,421	36,859	60,280	222	108	5,139	5,247	37	472	654	1,126
August.....	178	23,197	39,762	62,959	217	128	5,634	5,762	41	540	760	1,300
September.....	186	21,983	41,649	63,632	190	81	5,268	5,349	55	680	771	1,451
October.....	166	24,885	35,968	60,853	212	104	5,822	5,926	48	441	697	1,138
November.....	154	22,790	32,752	55,542	198	60	5,727	5,787	38	326	589	915
December.....	140	15,712	28,979	44,691	169	46	5,150	5,196	32	180	464	644
1924												
January.....	129	8,807	26,741	35,548	179	72	5,608	5,680	15	123	326	449
February.....	129	7,731	23,539	31,270	214	68	6,055	6,123	11	106	270	376
March.....	131	8,434	24,640	33,074	241	49	6,733	6,782	15	113	324	437
April.....	159	10,303	32,865	43,168	237	99	6,313	6,412	39	400	607	1,007
May.....	148	9,534	33,805	43,339	245	102	6,571	6,673	42	161	601	762
June.....	167	11,815	38,286	50,101	245	64	6,892	6,956	54	270	700	970
Total.....	1,862	188,612	395,845	584,457	2,569	981	70,912	71,893	427	3,812	6,763	10,575

## Summary

	Ships	Passengers	Crew	Total
Barge office.....	1, 862	188, 612	395, 845	584, 457
Quarantine.....	2, 569	981	70, 912	71, 893
City Island.....	427	3, 812	6, 763	10, 575
Total.....	4, 858	193, 405	473, 520	666, 925

*Race and sex of immigrants admitted to hospital during fiscal year ending June 30, 1924*

Race	Adult		Children		Total
	Men	Women	Male	Female	
Albanian.....	12	3		1	16
African (black).....	221	180	22	20	443
Arabian.....	27	10	1	4	42
Argentinian.....		1			1
Armenian.....	103	82	37	20	242
Austrian.....	2	5		2	9
Bohemian.....	2	5			7
Brazilian.....	29	6	4	4	43
Bulgarian.....	20	6	1	1	31
Canadian.....	9	3		1	13
Chilean.....	5				5
Croatian.....	12	7	4	2	25
Colombian.....	4				4
Cuban.....	17	3	2	2	24
Dalmatian.....	2				2
Dutch and Flemish.....	61	17	11	18	107
Egyptian.....	3		1		4
English.....	174	79	32	20	305
Estonian.....	7	6	1	1	15
Finnish.....	29	21	6	6	62
French.....	45	25	3	6	79
German.....	692	335	100	93	1, 220
Greek.....	132	56	20	13	221
Hebrew.....	630	594	280	254	1, 758
Hindoo.....	15	1			16
Hungarian.....	2				2
Italian (north).....	27	11	3	2	43
Italian (south).....	1, 456	429	224	221	2, 330
Irish.....	86	79	7	10	182
Japanese.....	5				5
Latvian.....	7	1			8
Lithuanian.....	28	34	14	12	88
Maltese.....	14			1	15
Macedonian.....	4	2		1	7
Magyar.....	71	64	30	23	188
Mexican.....	13				13
Mongolian.....	141	3	1		145
Montenegrin.....	2				2
Panama (Canal Zone).....				1	1
Persian.....	4				4
Peruvian.....	1				1
Polish.....	215	121	79	62	477
Portuguese.....	82	28	8	13	131
Rumanian.....	37	20	4	7	68
Russian.....	36	30	21	9	96
Scandinavian.....	287	96	34	32	449
Serbian.....	7	5	2		14
Slovakian.....	200	132	41	47	420
South American (Spanish).....	8	1	1		10
Spanish.....	190	30	13	15	248
Scotch.....	74	54	10	12	150
Swiss.....	5	2	1		8
Turkish.....	5	4	7	2	18
Ukrainian.....	1				1
United States born.....	42	19	74	72	207
Uruguayan.....	1				1
Venezuelan.....	1	1			2
Welsh.....	6	4			10
Not specified.....	105	44	3	9	161
Total.....	5, 461	2, 685	1, 109	1, 030	10, 285

*Races of immigrants deported on medical certificates during fiscal year ending June 30, 1924*

Race	Adults		Children		Total
	Men	Women	Male	Female	
Albanian.....	2	1			3
African (black).....	60	30	1	2	93
Arabian.....	5	1	1		7
Armenian.....	12	29	13	6	60
Austrian.....	4	1			5
Brazilian.....	7	1		2	10
Bulgarian.....	4	1			4
Canadian.....	1				1
Chilean.....	1				1
Cuban.....	6				6
Czechoslovakian.....	23	10	2	3	38
Dutch.....	8		1		9
Egyptian.....	2				2
English.....	29	6	2		37
Estonian.....	2				2
Finnish.....	1	1		1	3
Flemish.....	1	2		1	4
French.....	6	3	1		10
German.....	120	48	11	10	189
Greek.....	16	14	1	1	32
Hebrew.....	71	56	17	15	159
Hindoo.....	3				3
Irish.....	8	8			16
Italian (south).....	229	38	7	9	283
Latvian.....	1	1			2
Lithuanian.....		4	1	2	7
Magyar.....	18	7	2		27
Maltese.....	5				5
Mexican.....	2	1			3
Mongolian.....	8				8
Persian.....	1				1
Polish.....	33	9		5	47
Porto Rican.....	1				1
Portuguese.....	19				19
Rumanian.....	5	3			8
Russian.....	14	8	3	1	26
Ruthenian.....				1	1
Scandinavian.....	30	4		1	35
Scotch.....	11	2			13
Serbian.....	1	1			2
Spanish.....	41	7	2		50
Spanish American.....	1				1
Swiss.....	2	1		1	4
Syrian.....	6	4	1	1	12
Turkish.....	1	1			2
Ukrainian.....	2				2
United States born <sup>1</sup> .....	1				1
Welsh.....	1	2		1	4
Yugoslavia.....	16	2	1	2	21
Not specified.....	2	1			3
Total.....	843	307	67	65	1,282

<sup>1</sup> So stated.

*Nativity and race of immigrants certified for trachoma, year ending June 30, 1924*

Nativity	Race																																Total
	Armenian	Arabian	African (black)	Albanian	Brazilian	Bulgarian	Dutch	Egyptian	English	French	German	Greek	Hebrew	Irish	Latvian	Mongolian	Maltese	Magyar	Polish	Portuguese	Rumanian	Russian	Syrian	Italian (south)	Scandinavian	Serbian	Scotch	Slovak	Spanish	Ukrainian	United States born		
Austria											5																					5	
Armenia	32																															32	
Albania		3		1																													1
Arabia																																	3
Brazil					1																												4
Bulgaria						2																											2
British West Indies			1																														1
Czechoslovakia											1																	10					11
China																3																	3
Egypt								2			1																						3
France										1																							1
German											14																						14
Greece												9																					9
Holland							1																										1
Hungary											1								5														6
Italy																								80									80
Lithuania													1		5																		6
Latvia																1																	1
Malta																	2																2
Norway																										1							1
Portugal																				1													1
Poland											2		12						9														23
Russia											5		27																				42
Rumania											3		2					1				10											8
Spain														1																6			7
Serbia																						2											1
Syria																							9				1						9
Turkey	8											1																					9
Ukraine																															1		1
United Kingdom								1						1														2					4
United States born																																1	1
Yugoslavia											1																		2				3
Total	40	3	1	1	4	2	1	2	1	1	33	10	43	1	5	1	3	2	6	9	1	2	10	9	80	1	1	2	12	6	1	1	295

*Report of medical certificates relating to alien passengers*

Class A (I), including 16 insane, 32 moron, 2 idiocy, 12 imbecility, 7 epilepsy, 20 mental defective, and 71 certified for tuberculosis.

Total

160

Class A (II), loathsome contagious disease, including 295 conjunctivitis granular trachomatous, 37 syphilis, 22 chaneroid, 153 gonococcus infection urethra, 2 gonococcus of vagina, 12 trichophytosis (*tonsurans*), 70 trichophytosis (*unguium*), 7 syccosis barbæ, 6 clonorchiasis, 1 filariasis, 1 leprosy.

Total

606

Class B: Disease or defect which affects ability to earn a living

9,751

Class C: Disease or defects of less degree

8,760

*Report of medical certificates relating to alien seamen*

Class A (I), including 2 insane and 5 certified for tuberculosis.

Total

7

Class A (II), loathsome contagious diseases, including 21 syphilis, 19 chaneroid, 55 gonococcus infection urethra, 15 conjunctivitis granular trachomatous.

Total

110

Class B: Diseases or defects which affect ability to earn a living

24

Class C: Diseases or defects of less degree

7

*Race of aliens certified for mental condition during fiscal year ending June 30, 1924*

Race	Insanity	Moron	Idiocy	Imbecility	Epilepsy	Mental deficiency	Total
Armenian.....		1					1
Czechoslovakian.....						1	1
Dutch.....	1					2	3
English.....	2			1	1	1	5
Flemish.....						1	1
Finnish.....					1		1
French.....		1				1	2
German.....	3	5		6	2	3	19
Greek.....	1						1
Hebrew.....	1	14	1	2		6	24
Irish.....	3	1				1	5
Italian (south).....		4		1	2	3	10
Lithuanian.....		1		1			2
Magyar.....						1	1
Polish.....		1					1
Ruthenian.....		1					1
Scotch.....					1		1
Scandinavian.....	2	1	1				4
Spanish.....	3			1			4
Welsh.....		1					1
Yugoslavian.....		1					1
Total.....	16	32	2	12	7	20	89

*Disposition of immigrants certified*

<b>Class A (I):</b>	
Cases pending at beginning of year.....	5
Cases certified during year.....	160
Total to be accounted for.....	165
Cases deported.....	129
Cases landed.....	24
Cases pending close of year.....	12

<b>Class A (II):</b>	
Cases pending at beginning of year.....	36
Cases certified during year.....	606
Total to be accounted for.....	642
Cases deported.....	498
Cases landed.....	110
Cases pending close of year.....	34

<b>Class B:</b>	
Cases pending beginning of year.....	99
Cases certified during year.....	9, 751
Total to be accounted for.....	9, 850
Cases deported.....	505
Cases landed.....	9, 227
Cases pending close of year.....	118

<b>Class C:</b>	
Cases pending at beginning of year.....	36
Cases certified during year.....	8, 760
Total to be accounted for.....	8, 796
Cases deported.....	150
Cases landed.....	8, 610
Cases pending close of year.....	36

NOGALES, ARIZ.

Acting Asst. Surg. A. L. Gustetter in charge.

During the months of February, March, and April, 1924, about 110 cases of smallpox were reported in the city of Mazatlan, Sinaloa,

Mexico. The authorities there enforced vaccination on all passengers before permitting them to purchase their railroad or steamship tickets to leave Mazatlan.

All aliens arriving in this port are vaccinated unless they show evidence of immunity to smallpox.

#### PHILADELPHIA, PA.

Surg. Carroll Fox in charge.

In the early part of the year, the plan to examine the crews at quarantine for immigration purposes was put into effect with satisfactory results. One of the medical officers doing immigration work was detailed to the quarantine station at Marcus Hook, and the quarantine and immigration inspections are made at the same time. This double inspection takes somewhat longer, but the delay occasioned the vessel is not excessive.

During the year the staff was reduced by the death of one member, Acting Asst. Surg. G. F. Souwers, who had been with the service since 1918.

#### PHILIPPINE ISLANDS

Surg. H. F. Smith, chief quarantine officer for the Philippine Islands, in charge. Address, post-office box 424, Manila, P. I.

Aliens arrived and were inspected at the five principal ports of entry in the Philippine Islands, namely, Manila, Cebu, Iloilo, Jolo, and Zamboanga. Several new ports of entry have been authorized by the legislature, but have not been formally opened, except for outward shipments.

In the Philippine Islands the United States immigration laws are in force and are administered by the collectors of customs acting as immigration officers. The medical examinations are made by officers of the United States Public Health Service detailed for duty in the Philippines as quarantine officers. The majority of the aliens examined were from Asiatic countries. Owing to the results of the examinations made during the past five years, the routine examination of all arriving aliens for intestinal parasites, hookworm, etc., was discontinued. For a time a considerable number of cases of favus and ringworm of the scalp arrived, but, after a number of fines had been imposed in accordance with the immigration law, the number decreased to almost nothing, in view of the examinations made prior to embarkation at the port of departure by physicians employed by the steamship companies.

The work of examining aliens became so heavy as to interfere at times with the quarantine work of the station, so that the legislature was asked to appropriate sufficient funds for the employment of an additional officer to take over, at least in part, laboratory work and the physical examination of aliens. The legislature was convinced of the necessity of having an additional officer, and appropriated funds for his salary.

At the present time the facilities for the medical examinations of arriving aliens are no better than previously reported. In fact there are no facilities at all worthy of the name, and the work is performed under the most trying conditions, generally on board the arriving vessel, where conditions never are satisfactory.



The nationalities represented by the aliens who arrived during the last four calendar years are as follows:

Nationality	1920	1921	1922	1923
Chinese.....	14, 875	13, 987	13, 954	15, 307
Dutch and Flemish.....	81	78	73	80
East Indians.....	53	74	81	85
English.....	750	740	519	548
French.....	68	52	75	75
German.....	79	92	67	100
Irish.....	12	10	16	9
Italian.....	24	31	31	63
Japanese.....	952	874	584	799
Portuguese.....	79	70	43	48
Russian.....	70	99	53	95
Scandinavian.....	33	85	42	54
Scotch.....	32	24	53	43
Spanish.....	563	505	375	349
Syrian.....	38	18	15	10
Turkish.....	10	2	15	4
Other nationalities.....	133	104	54	106
Total.....	17, 852	16, 845	16, 050	17, 775

There were 76 boards convened to determine whether alleged minor children of domiciled aliens were more or less than 21 years of age. Of those examined, 65 were certified to be older than the age claimed.

The certifications were confined to a few diseases, those predominating being favus, ringworm of the scalp, blindness, trachoma, and intestinal parasites.

The number of immigrants arriving annually varies very little, the variations often being only that due to the arrival of one or two vessels just before or just after the end of the fiscal year.

#### EXAMINATION OF REFUGEES

In the report for last year it was stated that during January, 1923, there arrived at Manila 11 former Russian naval vessels, the personnel of which were housed for a number of months at the Mariveles quarantine station, whence they were removed to the naval reservation at Olongapo. There were 804 persons on the vessels. Later, because local conditions were considered unfavorable for the assimilation of these people, an Army transport was secured to convey them to the Pacific coast of the United States. In view of the fact that the expense of transportation was borne by public subscription and by the Red Cross, the local authorities were desirous that no person should be transported to the United States who would be debarred therefrom by the immigration law. The chief quarantine officer was officially requested by the Governor General to conduct a medical examination of all the emigrants whom it was intended to send to the United States. Of the 615 men, women, and children examined, 64 were rejected, of whom 29 came under class A and 35 under class B of the regulations governing the medical inspection of aliens. The majority of the intending emigrants were examined at Olongapo. The 529 refugees who left the Philippines in the first embarkation for the United States, and who had been examined a considerable period of time previously, were reexamined immediately before the sailing of the transport.

This work, while not coming under the quarantine immigration laws, was done for the purpose of assisting the insular government, as

well as the United States Government, in handling a delicate situation which had arisen by the arrival of the refugees in one of the possessions of the United States.

#### PORT HURON, MICH.

Acting Asst. Surg. George M. Kesi in charge.

The examining surgeon made a special effort to detect aliens with mental defect or disease. A routine series of questions and tests were followed, according to the age, advantages, and social status of the alien. Among the tests found to be most valuable in the detection of mental defects were construction puzzles, picture form boards, the cube test, counting forward and backward from 1 to 20, problems involving simple arithmetic, naming the days of the week forward and backward, naming the months and seasons of the year, and fixing holidays in the proper month of the year. A blackboard was installed in the medical examiners' quarters and used in giving simple problems in arithmetic to the aliens.

During the year the medical officer in charge made numerous visits to the St. Clair County jail to examine and afford medical care to detained aliens. Extensive alien smuggling operations along the St. Clair River border and the subsequent apprehension of aliens thus unlawfully attempting to enter the United States resulted in a small colony of detained aliens in this jail, the providing of necessary medical treatment for which required much extra duty.

#### PORTO RICO

Surg. D. N. Robinson in charge.

Owing to lack of facilities for hospitalization, venereally infected seamen could not be removed from vessels, but were permitted to remain aboard under a segregation guaranty by the master of the vessel.

#### QUEBEC, CANADA

Surg. O. H. Cox in charge.

The aspect of the work remains quite the same as in previous years. The inspection of passengers is carried on by United States immigration inspectors resident here simultaneously with the Canadian immigration authorities. All passenger vessels entering the St. Lawrence River stop at Quebec long enough to come alongside the piers, when first and second class passengers are inspected. The third-class passengers and any of the first and second class who may be detained are taken ashore and the vessels, except a few of the larger ones, proceed to Montreal.

#### RIO GRANDE AND ROMA, TEX.

Acting Asst. Surg. G. W. Edgerton in charge.

The number of aliens crossing at Roma greatly exceeds the number crossing at Rio Grande. All immigration work for the two ports is carried on at Rio Grande as the Immigration Service maintains no inspector at Roma other than the Public Health Service attendant.

During the year two cases of leprosy were diagnosed in Rio Grande. Both persons have been returned to Mexico for treatment, having been

given voluntary returns by the immigration inspector here after one of them had declared her intention to become a Mexican citizen, the other one being a Mexican national. The personnel of this office was instrumental in diagnosing both of these cases and bringing their existence to the attention of the local health authority.

#### SAN FRANCISCO, CALIF.

Surg. Dunlop Moore, chief medical officer.

The official duties devolving upon the service at this station may be conveniently treated under the following headings: (1) Medical inspection of aliens, (2) hospital, (3) laboratory, (4) miscellaneous.

#### MEDICAL INSPECTION OF ALIENS

In general primary examinations of steerage and second-cabin passengers and all secondary examinations are conducted at the Angel Island Immigration Station. We must again acknowledge our indebtedness to the quarantine boarding officers for their cooperation in the primary examination of seamen and cabin passengers on ship-board.

Physical and mental diseases and defects were certified as follows:

	Class A-I	Class A-II	Class B	Class C	Total
Alien passengers.....	4	103	302	180	589
Alien crew.....	3	47	3	1	54
Total.....	7	150	305	181	643

Numerically important causes of certification were clonorchiasis, with which disease 108 passengers and 42 seamen were afflicted, and uncinariasis found in 300 passengers and 2 seamen.

If space permitted, an interesting comparison might be made between the diseases of immigrants encountered here and those observed at Atlantic ports. In view of the great prevalence of leprosy in the Asiatic countries whence emanate the majority of our immigrants, it is notable that a search of the records of this station for 13 years past reveals no instance of certification of this disease. This record tends to demonstrate the efficiency of the quarantine examination to which immigrants are subjected before their arrival at the immigration station. In contrast to the comparative frequency of favus and ringworm of the scalp among certain European immigrants, the rarity of these two maladies among the Asiatics examined here is striking. Two cases of favus, both in Chinese, were recorded during 1913, and none since that date.

Among the rarer parasitic diseases encountered during the past year may be mentioned fasciolopsiasis (*Fasciolopsis buski*) and strongyliasis (*Trichostrongylus orientalis*). The ovum of the latter parasite bears a superficial resemblance to that of hookworm.

Curiously enough, no case of schistosomiasis or paragonomiasis has been recorded here during the past 12 months.

## HOSPITAL

The small immigrant hospital is, as formerly, operated under the immediate supervision of the Service officers, the medical inspection of aliens being conducted by the personnel attached to the hospital. This institution, while not completely equipped, handles fairly well the general run of minor ailments that develop among the aliens detained, and is of great value as a place of detention for aliens under observation pending diagnosis. The hospital is not provided with X-ray apparatus, possesses no psychopathic ward, and lacks isolation facilities.

During the fiscal year, total admissions to hospital numbered 575. Noteworthy diseases with number of cases were as follows: Uncinariasis, 195; scabies, 76; mumps, 33; cerebrospinal fever, 8 (excluding duplications); beriberi, 2; dextrocardia, 1. The entire absence of scarlet fever is noted. The relatively small number of admissions on account of measles (3) is difficult to explain.

## LABORATORY

In addition to the ordinary laboratory work that is incidental to the operations of the hospital and which presents no features of special interest, the microscope renders indispensable service in the diagnosis and certification of diseases affecting immigrants. In this connection particular importance is attached to the microscopic examination of the dejecta for ova of parasites.

During the year, 4,529 specimens of feces were examined. Of these 2,041 were found to be negative as regards ova of helminths, and 2,488 specimens contained ova (or embryos) of various helminths as indicated in the following table:

Helminth	Number of specimens
<i>Clonorchis sinensis</i> (alone).....	124
Hookworm (alone).....	74
Roundworm (alone).....	1,042
Whipworm (alone).....	475
<i>Clonorchis</i> and hookworm.....	4
<i>Clonorchis</i> and roundworm.....	25
<i>Clonorchis</i> , hookworm, and roundworm.....	7
<i>Clonorchis</i> and whipworm.....	25
<i>Clonorchis</i> , hookworm, and whipworm.....	6
<i>Clonorchis</i> , hookworm, roundworm, and whipworm.....	11
Hookworm and roundworm.....	89
Hookworm and whipworm.....	42
Hookworm, roundworm, and whipworm.....	99
Roundworm and whipworm.....	418
<i>Fasciolopsis buski</i> (alone).....	1
<i>Fasciolopsis buski</i> , hookworm, roundworm, and whipworm.....	1
<i>Fasciolopsis buski</i> , hookworm, and whipworm.....	2
<i>Fasciolopsis buski</i> and roundworm.....	2
<i>Fasciolopsis buski</i> and whipworm.....	1
<i>Strongyloides stercoralis</i> (alone).....	2
<i>Strongyloides stercoralis</i> , <i>clonorchis</i> , and roundworm.....	1
<i>Strongyloides stercoralis</i> , hookworm, roundworm, and whipworm.....	1
<i>Tænia saginata</i> (alone).....	1
<i>Tænia saginata</i> , hookworm, roundworm, and whipworm.....	1
<i>Tænia saginata</i> , <i>clonorchis</i> , roundworm, and whipworm.....	1
<i>Trichostrongylus orientalis</i> (alone).....	1
<i>Trichostrongylus orientalis</i> and whipworm.....	1
Unidentified ova.....	2

It is believed that the foregoing table conveys a fairly accurate idea of the extent of infestations and the principal parasites encountered. A number of reexaminations are included, causing a certain amount of

duplication. In many instances aliens had received anthelmintic treatment prior to examination. It is difficult to evaluate the exact influence of these and other factors upon our statistics. The entire absence of certain common parasites, e. g., *Hymenolepis nana*, is noteworthy. It is desired to emphasize the rarity of cestode infestations in eastern Asiatics. The three cases of *tænia* tabulated occurred, respectively, in a Korean, long resident in America, a Chinese woman, many months absent from Asia, and a Hindu of unknown antecedents.

## MISCELLANEOUS

Out-patient relief was extended when required to detained aliens and, in emergencies, to station employees. The number of such treatments given during the year totaled 816.

When requested by the Commissioner of Immigration, this office submitted opinions in regard to sanitary and other problems. Applicants for admission to the United States sometimes make incorrect statements regarding their ages, and the opinion of this office has been sought in such cases. One hundred and eighteen such estimates of age have been formally submitted by us. In this connection the possibility of retardation of physical development by diseases due to intestinal parasites has been given careful consideration.

When requested by the proper authorities, this office has made the physical examinations required by civil-service regulations in the case of persons seeking classified positions in the Immigration Service.

## TUCSON, ARIZ.

Acting Asst. Surg. I. E. Huffman in charge.

The United States Immigration Service detention quarters located at Tucson, Ariz., have accommodations for 24 male and 12 female aliens, and the station hospital room can be made to accommodate 6 aliens. All strictly immigration cases for the entire State of Arizona, with the exception of Yuma, which is a substation of Los Angeles, Calif., are detained when necessary in the Tucson quarters until ordered deported or released by the Secretary of Labor. Practically all detained aliens held in the local detention quarters under warrant proceedings are examined by the medical officer, the exceptions being those apprehended at the border ports of Nogales, Naco, and Douglas. The medical officer prescribes for the detained aliens, and when necessary personally attends them, being subject to call at all hours. Aliens confined in the local county and city jails, awaiting trial or serving sentence, who are made the subjects of deportation proceedings by immigration officers, are also examined, though the medical officer does not prescribe for or attend this class of cases until they are turned over to the Immigration Service. No accurate record is kept of aliens examined with a view to their deportation, who are found to be in good health, and who for sufficient reasons are released by the immigration officers. However, the fair average should be probably double the number certified or in whose cases certifications are issued and of record. There has been a marked decrease in the number of certified cases during the fiscal year just closed. This is seemingly accounted for by the greater proportion of European aliens handled under deportation proceedings. It appears that loathsome and contagious diseases, such as trachoma, are not so prevalent among this class of aliens as among the poorer class of Mexicans.

## DIVISION OF SANITARY REPORTS AND STATISTICS

In charge of Asst. Surg. Gen. B. J. LLOYD

The division of sanitary reports and statistics is charged with the work of securing information of the prevalence of diseases dangerous to the public health, both in the United States and abroad, compiling the data, and publishing it for the information of officers of the Public Health Service, State and local health officers, and other sanitarians. This division also has charge of the distribution of the publications of the service; the compilation and publication of laws, ordinances, and regulations pertaining to public health; and the dissemination of information on health subjects by means of the radio, stereopticon slides, and motion pictures. The division issues the weekly Public Health Reports, including supplements, and articles of general interest are reprinted for economical distribution.

### MORBIDITY REPORTS

To enable the Public Health Service properly to perform the duties imposed upon it by law, especially the prevention of the spread of diseases dangerous to the public health from State to State and the introduction of such diseases from foreign countries, a knowledge of the localities in which these diseases are present is necessary. Endemic foci must be known as well as the presence of epidemics; and incipient epidemics must be recognized in time to enable measures to be taken to prevent the spread of the disease before it is too late. Knowledge of when, where, and under what conditions cases of a communicable disease are occurring is essential as the basis for effective work in the prevention of the introduction or spread of disease.

In addition to reports from the officers of the Public Health Service, stationed in all sections of the United States and at many important foreign ports, the Public Health Service secures reports from State and local officers in the United States and from American consuls in foreign countries in accordance with the provisions of the act of February 15, 1893, and other statutes.

### COLLABORATING AND ASSISTANT COLLABORATING EPIDEMIOLOGISTS

The cooperation of State and local health departments is needed in securing information of the prevalence of diseases dangerous to the public health in the United States. In order to assist the States in obtaining the reports which are needed by the Public Health Service as well as by the State health departments, collaborating and assistant collaborating epidemiologists have been appointed in all the States which are cooperating with the Public Health Service in the collection of morbidity reports. In pursuance of the plan which has been in operation since December, 1913, an officer of the State health department is appointed by the Secretary of the Treasury as collaborating epidemiologist for his State. He is the State health officer or

some officer in the department recommended by the State health officer for the Federal appointment. He supervises the work in the State, collects the data, and prepares and transmits to the Public Health Service the reports for his State. Officers of county and municipal health departments are similarly appointed as assistant collaborating epidemiologists. They secure reports of the notifiable diseases from physicians, hospitals, and other sources and transmit the original reports, or copies or abstracts, to the collaborating epidemiologist in the State health department. Certain data from cities having more than 10,000 population are sent direct to the Public Health Service. In the collection of these reports and in necessary correspondence concerning them, the collaborating and assistant collaborating epidemiologists, as officers of the United States Government, use penalty envelopes.

When the first appointments were made, the collaborating epidemiologists were paid at the rate of \$300 per annum, but as more States cooperated with the Public Health Service it was found necessary, owing to the limited appropriations available for the purpose, to make the appointments at the nominal salary of \$1 per annum. At the close of the fiscal year 1924, 15 collaborating epidemiologists were employed at \$300 a year, and 27 were carried on the rolls at \$1 a year. Owing to limited appropriations it will be impossible to continue these salaries.

The following table shows the States which are cooperating with the Public Health Service in the collection of morbidity reports in pursuance of this plan, and the number of collaborating and assistant collaborating epidemiologists in each State:

*Collaborating and assistant collaborating epidemiologists as of June 30, 1924*

State	Collaborating epidemiologists	Assistant collaborating epidemiologists	State	Collaborating epidemiologists	Assistant collaborating epidemiologists
Alabama.....	1	24	Montana.....	1	0
Arizona.....	1	14	Nebraska.....	1	96
Arkansas.....	1	236	New Jersey.....	1	0
California.....	1	294	New Mexico.....	0	26
Colorado.....	1	219	North Carolina.....	1	102
Connecticut.....	1	0	North Dakota.....	1	86
Delaware.....	1	0	Ohio.....	1	165
Florida.....	1	5	Oklahoma.....	1	75
Georgia.....	1	27	Oregon.....	1	126
Idaho.....	1	0	South Carolina.....	1	0
Illinois.....	1	103	South Dakota.....	1	63
Indiana.....	1	536	Tennessee.....	1	9
Iowa.....	1	314	Texas.....	1	321
Kansas.....	1	116	Utah.....	1	0
Kentucky.....	1	132	Vermont.....	1	10
Louisiana.....	1	9	Virginia.....	1	27
Maine.....	1	477	Washington.....	1	20
Maryland.....	1	78	West Virginia.....	1	106
Massachusetts.....	1	0	Wisconsin.....	1	225
Michigan.....	1	2	Wyoming.....	1	25
Minnesota.....	1	1			
Mississippi.....	1	83	Totals.....	42	4, 271
Missouri.....	1	119			

#### STATE MORBIDITY REPORTS

Through the cooperation of State health departments and with the assistance of collaborating and assistant collaborating epidemiologists in most of the States, reports of the prevalence of diseases

dangerous to the public health were received by the division of sanitary reports and statistics during the fiscal year ended June 30, 1924. Preliminary reports were received by telegraph each Monday, giving the number of cases of communicable diseases reported in the State for the week ended on Saturday. Mail reports, giving more detailed information, especially as to the geographic distribution of the several diseases within the State, were received monthly, and summaries for the calendar year 1923, giving information as to the number of deaths from the communicable diseases, as well as the number of cases, were received as early in the year 1924 as the data were compiled in the State health departments. Weekly reports and reports for the calendar year 1923 were also received direct from the health departments of cities in the United States having more than 10,000 population.

#### WEEKLY TELEGRAPHIC REPORTS

Regular weekly telegraphic reports were received from the health officers of 37 States and the District of Columbia. These reports included the numbers of cases of communicable diseases during the preceding week which had been received in the State health department at the time of sending the telegram, which in most instances was Monday evening. Although not complete, these reports show the general trend of the incidence of diseases which menace the public health throughout the country.

The figures for each State are published weekly in the Public Health Reports, and the total number of cases of each of the principal diseases is compared with the number reported for the corresponding week of the preceding year. This enables comparisons to be made which indicate the rise or fall in the numbers of cases of each disease, and show the conditions throughout the United States as compared with preceding years at the same season of the year.

The following is a list of States from which these telegraphic reports were received during the fiscal year ended June 30, 1924:

Alabama.	Kansas.	New York.
Arizona.	Louisiana.	North Carolina.
Arkansas.	Maine.	North Dakota.
California.	Maryland.	Oregon.
Colorado.	Massachusetts.	South Dakota.
Connecticut.	Michigan.	Texas.
Delaware.	Minnesota.	Vermont.
District of Columbia.	Mississippi.	Virginia.
Florida.	Missouri.	Washington.
Georgia.	Montana.	West Virginia.
Illinois.	Nebraska.	Wisconsin.
Indiana.	New Jersey.	Wyoming.
Iowa.	New Mexico.	

#### MONTHLY STATE REPORTS

During the fiscal year five States (Georgia, Missouri, Nevada, Tennessee, and Utah) were added to the list of States which send monthly reports of the prevalence of communicable diseases to the Public Health Service.

These reports are more nearly complete than the telegraphic reports, as all late reports from remote parts of the State are included. The figures for each disease are given by counties, which enables the sani-



tarian to ascertain in what sections of the State each disease is most prevalent.

A new form of blank for collecting the monthly reports from States was adopted during the fiscal year. This blank lists the counties in each State, is more easily filled out by the clerks in the State departments of health, and presents the data in more concise form than the blanks formerly used.

The reports are compiled in the division of sanitary reports and statistics and published in tables which combine the figures for each quarter of the year. This not only saves space and expense in printing, but makes it possible for the statistician or sanitarian to find the complete reports for each year by consulting only four issues of the Public Health Reports.

A list of the States which furnish these monthly reports follows:

Alabama.	Louisiana.	Ohio.
Arizona.	Maine.	Oklahoma.
Arkansas.	Maryland.	Oregon.
California.	Massachusetts.	Pennsylvania.
Colorado.	Michigan.	Rhode Island.
Connecticut.	Minnesota.	South Carolina.
Delaware.	Mississippi.	South Dakota.
District of Columbia.	Missouri.	Tennessee.
Florida.	Montana.	Utah.
Georgia.	Nebraska.	Vermont.
Hawaii (Territory of).	Nevada.	Virginia.
Idaho.	New Jersey.	Washington.
Illinois.	New Mexico.	West Virginia.
Indiana.	New York.	Wisconsin.
Iowa.	North Carolina.	Wyoming.
Kansas.	North Dakota.	

#### ANNUAL REPORTS

Reports of the number of cases of each of the principal notifiable diseases for the calendar year 1923, with the number of deaths attributed to each disease, were received from State health departments. While all of the data desired were not included by some of the States, every State sent some report for the year.

The information was compiled in the division of sanitary reports and statistics, published in the Public Health Reports, and reprinted for economical distribution to health officers and other sanitarians.

The records of the last nine years were examined, and from these records was calculated for each month the number of cases of each disease which might reasonably be expected in 1923 in each State judging from the experience of the past, omitting epidemics. This figure, which has been termed the "estimated expectancy," was used for comparison with the actual figure reported for the month for the year 1923, and these "estimated expectancies" serve as standards by which to compare disease conditions each month during that year with the years immediately preceding. Annual case, death, and mortality rates were calculated and published for each disease for each State which reported the necessary data.

#### CITY REPORTS

Weekly reports were received from 564 cities of over 10,000 population. These reports give the number of cases of each notifiable disease and the deaths attributed to each disease, as well as the total

number of deaths for the week in each city. Some cities are not able to supply all of the data desired, but the principal items are given by most of the cities.

The following table gives the number of cities in each State from which these weekly reports are received:

Alabama.....	6	Nevada.....	1
Arizona.....	1	New Hampshire.....	6
Arkansas.....	4	New Jersey.....	33
California.....	21	New Mexico.....	1
Colorado.....	5	New York.....	38
Connecticut.....	17	North Carolina.....	7
Delaware.....	1	North Dakota.....	2
District of Columbia.....	1	Ohio.....	43
Florida.....	3	Oklahoma.....	3
Georgia.....	9	Oregon.....	1
Idaho.....	2	Pennsylvania.....	77
Illinois.....	29	Rhode Island.....	7
Indiana.....	22	South Carolina.....	3
Iowa.....	13	South Dakota.....	1
Kansas.....	11	Tennessee.....	4
Kentucky.....	6	Texas.....	12
Louisiana.....	2	Utah.....	2
Maine.....	8	Vermont.....	3
Maryland.....	3	Virginia.....	10
Massachusetts.....	62	Washington.....	8
Michigan.....	19	West Virginia.....	9
Minnesota.....	10	Wisconsin.....	21
Mississippi.....	1	Wyoming.....	1
Missouri.....	7		
Montana.....	6	Total.....	564
Nebraska.....	2		

During the fiscal year, a radical change was made in the manner of preparing and printing the weekly reports from cities. Previously the data from all cities which reported were compiled in tabular form and published each week. Comparisons of one week with another or with the corresponding week of other years required considerable time and the use of several volumes. To make the statistics presented each week of more value, 105 cities in all parts of the United States and having an aggregate population of about 29,000,000, were selected. The data from these cities is presented in tabular form, and for the principal diseases the "estimated expectancy," based on the experience of the last nine years, is printed in a parallel column. A separate table gives the totals for each disease for the preceding 10 weeks. This plan makes it possible to see at a glance the trend in urban communities of each communicable disease included in the tables, and it is easy to ascertain whether the disease is increasing or decreasing in any particular section of the country. The relative prevalence of each disease as compared with previous years is also shown. At the same time the limiting of the number of cities included in the weekly tables reduces the space occupied and results in economy in printing.

The data from the cities which are not included in the tables above described are published each quarter in compact form, combining the information from the reports for 13 weeks into one table.

Summaries of the number of cases of notifiable diseases, with the number of deaths from these diseases, during the calendar year 1923, in cities of the United States having over 10,000 population, have been prepared, printed in the Public Health Reports, and reissued as

reprints. Case rates (number of cases for each thousand inhabitants), death rates, and fatality rates (number of deaths for each hundred cases) were computed for each disease. Similar summaries have been published by the Public Health Service each year since 1912.

#### FOREIGN REPORTS

Reports of the prevalence of quarantinable diseases and other diseases dangerous to the public health were received during the fiscal year from officers of the Public Health Service stationed abroad, from foreign governments, and from the health section of the League of Nations. In addition, weekly reports were received from American consular officers stationed at foreign ports and places pursuant to the provisions of the act of February 15, 1893. The information from these sources was examined for evidence of diseases which might be introduced into the United States, and summaries of the reports were published currently in the Public Health Reports, as required by the statute above referred to.

Two tables were published each week, giving the number of cases and deaths of cholera, plague, smallpox, typhus fever, and yellow fever reported from each locality. The first table gave the data received during the week immediately preceding publication, and the other table gave the totals of all reports received since the beginning of the current six-month period. This second table is discontinued and a new table begun with the first issue in January and June of each year.

A new method of keeping the office records of the foreign reports of quarantinable diseases has been adopted. All reports of these diseases from any foreign locality are now tabulated on cards as soon as received, and these cards will in the future furnish a convenient record of the prevalence of cholera, plague, smallpox, typhus fever, and yellow fever throughout the world as far as reports of these conditions are available.

#### PREVALENCE OF DISEASE

The following table gives a summary of the reports received from State health officers for a few of the more important communicable diseases for the calendar year 1923:

Disease	Number of States reporting <sup>1</sup>	Aggregate population	Cases reported	Deaths reported	Cases per 100,000 population	Deaths per 100,000 population	Deaths per 100 cases
Diphtheria.....	45	109, 183, 801	144, 824	12, 339	132.6	11.3	8.5
Measles.....	45	109, 183, 801	752, 529	10, 282	689.2	9.4	1.4
Scarlet fever.....	44	104, 244, 171	173, 168	3, 442	166.1	3.3	2.0
Smallpox.....	45	109, 183, 801	30, 771	160	28.2	.1	.5
Tuberculosis.....	44	109, 106, 394	-----	97, 264	-----	89.1	-----
Typhoid fever.....	44	106, 715, 158	34, 122	7, 653	32.0	7.2	22.4

<sup>1</sup> In addition to the number of States given, the District of Columbia is included.

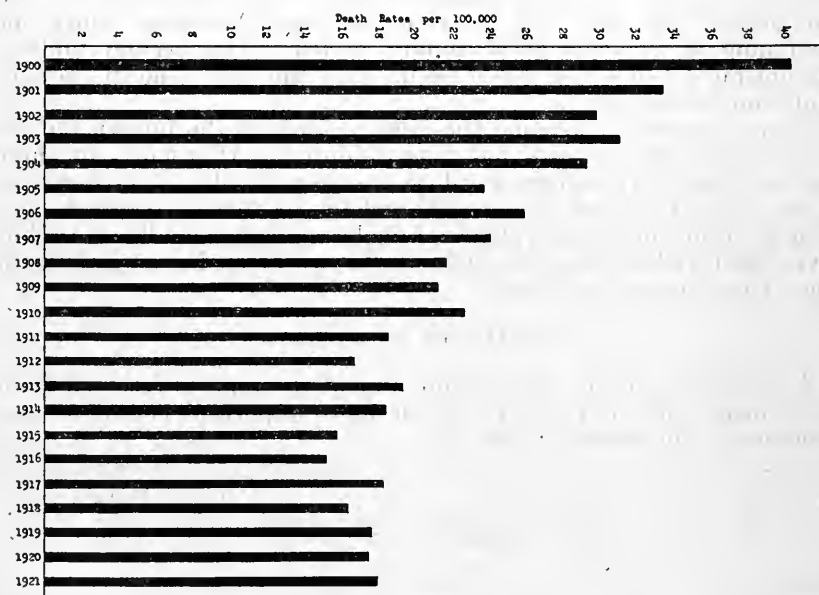
*Diphtheria.*—Forty-five States, having an aggregate population of over 109,000,000, reported 144,824 cases of diphtheria, which is 132.6 cases per 100,000 population. This is an improvement over the reports for the preceding year (1922) when there were 164.1 cases

per 100,000. However, as the means of preventing diphtheria are well known to physicians, the figures indicate that much remains to be done, and many lives can be saved in the United States by the use of diphtheria toxin-antitoxin. The death rate from diphtheria was 11.3 per 100,000 population in 1923. In 1922 it was 14.3 per 100,000.

The following table shows the diphtheria death rates per 100,000 population in the original registration States from 1900 to 1921, inclusive:

1900	40.4	1911	18.5
1901	33.4	1912	16.8
1902	29.7	1913	19.2
1903	31.0	1914	18.4
1904	29.3	1915	15.8
1905	23.6	1916	15.1
1906	25.8	1917	18.2
1907	24.0	1918	16.4
1908	21.6	1919	17.7
1909	21.1	1920	17.4
1910	22.5	1921	17.9

The reduction in the death rates during this period is shown graphically in the following chart:



Death rates from diphtheria per 100,000 population in the original registration States, 1900 to 1921, inclusive

*Measles.*—This disease was unusually prevalent in most sections of the United States during the calendar year 1923. Forty-five States reported three-quarters of a million cases of measles with more than 10,000 deaths. The death rate (9.4 per 100,000 population) for 1923 was more than two and a half times that for 1922 (3.5 per 100,000).

*Scarlet fever.*—The reports indicated very little change from the preceding year in the prevalence of scarlet fever. For 1923, 166.1 cases per 100,000 population were reported, while for 1922 there were

153.5 cases per 100,000. The death rate from this disease was practically the same for each year—3.3 and 3.2 per 100,000.

*Smallpox.*—The reports of smallpox for the calendar year 1923 and the first six months of the year 1924 afford a striking example of the danger of neglecting smallpox vaccination. Relatively few cases of smallpox were reported in the United States during 1923, and 45 States reported only 160 deaths from this disease for the entire year. But during the first half of the calendar year 1924 outbreaks of virulent smallpox occurred in Detroit, Mich., Toledo, Ohio, Pittsburgh, Pa., Duluth, Minn., and other places. During the six months 159 deaths from smallpox were reported from these four cities alone.

*Tuberculosis.*—For 1923 the death rate from tuberculosis was 89.1 per 100,000 population. For 1922 the rate was 92.0.

*Typhoid fever.*—The case rates for typhoid fever were as follows: 1922, 34.6 cases per 100,000 population; 1923, 32.0 cases per 100,000. The death rates show a continuation of the general decline in deaths from typhoid fever in the United States, which has been evident for years and which is undoubtedly due, in part at least, to public-health work, including the supervision of water and milk supplies and the dissemination of information regarding the means of preventing the disease by antityphoid vaccination, the proper disposal of excreta, and the avoidance of possibly contaminated water, milk, and other foodstuffs.

#### SANITARY LEGISLATION

During the fiscal year work was completed on a volume of municipal ordinances and regulations pertaining to public health adopted during the period 1920–1922 by cities of the United States having a population of over 10,000 in 1920. Also compilations of State laws and regulations relating to public health for the years 1921 and 1922 were prepared and the copy sent to the printer.

Abstracts of current court decisions rendered by State and Federal courts of last resort and of interest to officers of the Public Health Service, to health officers and other public health workers, were prepared and published in the Public Health Reports at intervals throughout the year.

The digesting of current decisions of the Comptroller General of the United States on matters pertaining to the Public Health Service was continued, with a view to possible subsequent publication for the information generally of the service personnel.

Inquiries were received during the year for information regarding the health laws of the several States with reference to specific subjects. These inquiries were answered to the fullest extent possible with the limited personnel available for this work.

It is evident from the inquiries received that compilations of State and Federal laws relating to the more important public-health subjects, with digests of the court decisions construing these laws and determining the law relating to these subjects, would be of great value, but the limited personnel makes it impossible to undertake this work at present.

#### PUBLICATIONS ISSUED BY THE DIVISION

The Public Health Reports (vol. 38, pt. 2, and vol. 39, pt. 1) was issued each week during the fiscal year. It contained 3,245 pages,

exclusive of title-pages, tables of contents, and indexes, as compared with 3,139 pages during the preceding fiscal year. Approximately one-third to one-half of this material consisted of reports of special scientific research, digests of current court decisions, and other articles dealing with subjects of particular interest to public-health officials, sanitarians, and public-health workers in general. The remainder consisted of current morbidity data collected from various sources—domestic and foreign—compiled in the division and printed in tabular form. The Public Health Reports, which has been issued under the present title since 1896, is especially the medium of the Public Health Service for the publication of such current data and other sanitary information.

Eighty-nine of the text articles (comprising 1,592 pages) were issued as reprints from Public Health Reports, and 25 previous reprints and 3 supplements dealing with trachoma, malaria, and scarlet fever, were revised and issued in new editions. By this means economical distribution was afforded to officers of the service, health officials, and other persons interested in public-health work and entitled by law to receive these publications.

Two new supplements (Nos. 43 and 44) to the Public Health Reports were published during the fiscal year. Supplement 43 is a compilation of State sanitary laws and regulations enacted or adopted during 1920 and contains 435 pages of text matter, while supplement 44, containing 329 pages, is a compilation of selected sanitary ordinances and regulations adopted during the three-year period 1920–1922 by cities having over 10,000 inhabitants in 1920.

#### SECTION OF PUBLIC HEALTH EDUCATION

During the fiscal year ended June 30, 1924, 109 new publications were issued, as compared with 108 during the preceding year. The total number of copies of these publications and of reprints of previous documents distributed aggregated 527,614, as compared with 591,690 copies during the preceding fiscal year. The 527,614 publications sent in response to 26,723 public requests do not include those printed and distributed by the division of venereal diseases.

During the fiscal year 23 mimeographed bulletins were prepared and issued by the Public Health Service to newspapers, publishing agencies, and individuals. These dealt largely with the results of studies and investigations made by the Public Health Service.

In response to 73 requests, 5,493 stereopticon slides were loaned. The work of the stereopticon library has been greatly hampered during recent years, owing to the shortage of slides and to the lack of funds for making new slides.

The section of public health education has been called upon during the fiscal year to furnish exhibits for various public-health meetings. Suitable publications were selected and mounted on large wall placards to send in response to such requests.

A greater part of the exhibit material used at the Brazilian Centennial Exposition at Rio de Janeiro during 1922 and 1923 was transferred to the United States National Museum, Washington, D. C., for permanent exhibition and has aroused considerable interest.

The section has received many requests for the loan of exhibit material, posters, and motion pictures, but because of the lack of funds, compliance with most of these requests has been impossible.

## HEALTH INFORMATION BY RADIO

In the annual report for 1923 an account was given of the origin and development of the health information by radio service which is carried on by this division.

It may be repeated that this service was created for the purpose of giving out authoritative information in popular language relating to the nature, causes, and prevention of disease and the conservation of health.

One lecture requiring approximately 10 minutes for delivery is mailed from this bureau every Saturday morning throughout the year. Eighteen cooperative stations were added during the fiscal year, bringing the total number of cooperating stations up to 48 in number—not including the use that is made of these lectures in certain foreign countries where they are translated, revised, and sometimes rewritten for delivery by radio or for publication in some other way.

In addition to the delivery of these lectures by radio, they are, after delivery, available and are published in many newspapers and magazines.

By far the most effective publishing of this information is that secured by the foreign-language information service, which translates the lectures into from 10 to 15 languages and supplies these translations to between 700 and 800 foreign-language newspapers published in nearly every part of the United States.

It may be of interest to give the titles of some of these lectures and the number of times that they were published in the foreign-language press during the year, as follows;

	Times published
Insulin.....	30
Hygiene of the eye.....	45
Value of exercise.....	54
Rickets.....	54
Infant care in the winter months.....	55
Whooping cough.....	56
Asthma.....	64
Infant care in the summer months.....	66
Care of the ear.....	67
How some infectious diseases are spread.....	67
Scabies.....	70
Neuralgia.....	70
Epilepsy.....	73
Casualties of the Fourth of July.....	79
Diabetes.....	83
Factory ventilation.....	84
Sunstroke.....	99
Heading off heart disease.....	101
Hygiene of old age.....	127

To sum up, it may be stated that of 52 lectures issued during the year, there were published, one or another, in foreign languages, a total of 3,857 in whole or in part, usually in their entirety, making a total of 3,079,309 words published during the year, reaching (potentially) between sixty and seventy millions of readers.

No such check is possible of the publication of these lectures in English.

No extra expense is involved in the production of these lectures, as they are contributed by officers of the Public Health Service.

## DIVISION OF MARINE HOSPITALS AND RELIEF

In charge of Asst. Surg. Gen. F. C. SMITH

It is now 126 years since the Federal Government began to provide medical and hospital treatment for seamen of American ships. This policy has never been interrupted. The volume of work reflects from year to year the growth and increasing activities of the merchant marine. (See fig. 1.) It has been a constant policy of the Public Health Service to construct and maintain marine hospitals only in ports where the operations are large or where satisfactory hospital provisions can not be otherwise secured. Thus, while out-patient relief and hospital care are now furnished in 143 ports in the United States and its insular possessions, only 25 marine hospitals are in operation.

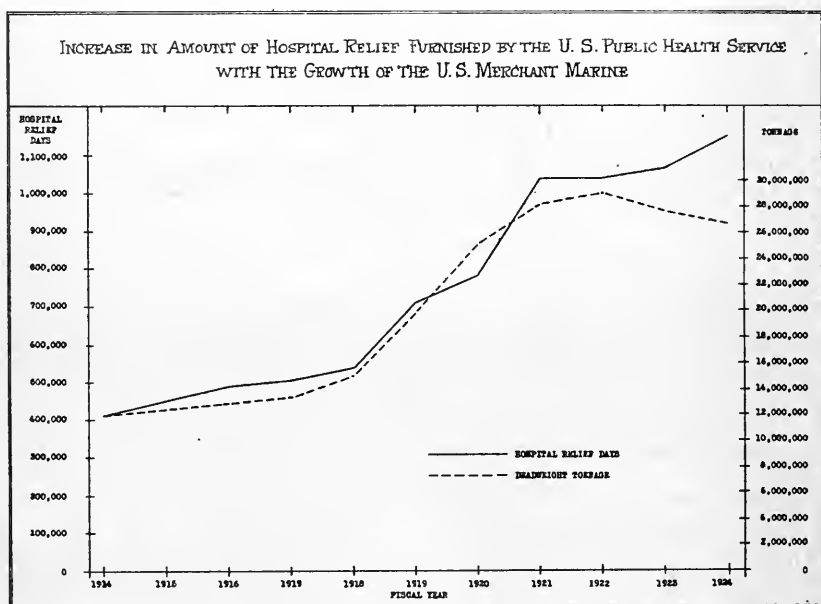


FIG. 1.

To keep pace with changing conditions in the world of ships, it has been necessary to extend relief activities at certain ports and sometimes to curtail the same at others for purposes of economy. Relief stations were opened at Cape May, N. J., and Lee Hall, Va., during the past fiscal year. There has been a phenomenal growth in shipping activities on the Pacific coast and an increased traffic through the Panama Canal, accompanied by a correspondingly increased demand for medical and surgical care at most ports on the Pacific coast and on the Gulf of Mexico. Demands for additional relief facilities to serve important ports in Texas have been manifested by the introduction of a bill (H. R. 605), now pending before the



Congress, to construct a marine hospital at Galveston, in which port and its vicinity an average of 52 patients are constantly maintained in contract hospitals.

At the close of the fiscal year 3,282 patients remained in hospital, or 377 more than on June 30, 1923. Although there has been a decrease in the number of patients of the United States Veterans' Bureau, the number now treated by the Public Health Service being inconsiderable, there was an increase of 7.7 per cent in hospital relief days provided for other (regular) beneficiaries of the service and an increase of 41 per cent in the number of out-patient treatments. A total of 1,145,751 hospital relief days were provided for regular beneficiaries in addition to 87,003 hospital days for patients of the Veterans' Bureau. Table 2 (p. 224) shows the total number of patients in marine hospitals and contract institutions during the year 1924.

#### CLASSES OF BENEFICIARIES

Originally limited to seamen from American merchant ships, the benefits of medical and hospital care have been extended from time to time to other classes of patients by acts of Congress or other competent authority, as shown in the list of beneficiaries below. Some of these are entitled to limited benefits only, such as physical examinations, often of a certain prescribed character. The relative importance of the various classes of beneficiaries is shown in Table 3 (p. 225). In general, American merchant vessels and governmental agencies concerned with nautical matters supply approximately 65 per cent of the patients.

### BENEFICIARIES AND PAY PATIENTS, UNITED STATES PUBLIC HEALTH SERVICE

#### BENEFICIARIES OF THE PUBLIC HEALTH SERVICE

##### *Entitled to hospital relief and other benefits*

##### *Seamen of merchant marine.*

(Acts of July 16, 1798, June 29, 1870, Mar. 3, 1875; Joint Resolution Feb. 10, 1871, U. S. Revised Stats. 4577; Acts Mar. 3, 1919, and June 24, 1914.)

##### *Officers and enlisted men, U. S. Coast Guard.*

(Ops. Atty. Gen. May 7, 1896, and June 11, 1896; Acts Aug. 4, 1894, June 24, 1914, and Mar. 3, 1919.)

##### *Officers and seamen, U. S. Coast and Geodetic Survey.*

(Treas. Dept. Cir. No. 11, Jan. 24, 1905, approved by the President, and Act Mar. 3, 1919.)

##### *Keepers and assistant keepers, U. S. Light House Service.*

(Acts Aug. 28, 1916, and Mar. 3, 1919.)

##### *Officers and crews, U. S. Bureau of Fisheries.*

(Act July 1, 1918.)

##### *Seamen, vessels of the U. S. Army (Engineer Corps and Army transports).*

(Act Mar. 3, 1919.)

##### *Seamen, Mississippi River Commission.*

(Act Mar. 3, 1919.)

##### *Patients of the U. S. Employees Compensation Commission.*

(Acts Sept. 7, 1916, and Mar. 3, 1919.)

##### *Officers and employees, U. S. Public Health Service.*

(Acts June 23, 1913, Sept. 7, 1916, and Mar. 3, 1919.)

##### *Lepers.*

(Acts Mar. 3, 1905, and Feb. 3, 1917.)

*Entitled to physical examinations only**Civil-service employees for retirement.*

(Act May 22, 1920.)

*Civil-service employees suspected of having tuberculosis.*

(Executive order Feb. 28, 1906.)

*Civil-service applicants and employees.*

(Executive order June 18, 1923.)

*Applicants for pilot's license.*

(Letter request from Bureau of Navigation.)

*Able-bodied seamen.*

(Letter request from shipping commissioner or from master or owner of vessel.)

*Applicants for military pensions.*

(Letter request from Bureau of Pensions.)

*Officers' Reserve Corps, U. S. Army.*

(Departmental agreement. Bureau Circular No. 353, Apr. 17, 1922.)

*Citizens' military training camps.*

(Departmental agreement. Bureau Circular No. 336, Feb. 23, 1922.)

*Personnel, U. S. Coast Guard (entrance, promotion, retirement).*

(Acts June 22, 1906, 34 Stat. L. 452; Apr. 12, 1902, 32 Stat. L. 100; June 28, 1915, 38 Stat. L. 800.)

*Entitled to vaccination against smallpox and typhoid fever**Civil employees in interstate travel or handling mail.*

(Treasury Department Circular No. 313, Nov. 24, 1922.)

PAY PATIENTS OF THE U. S. PUBLIC HEALTH SERVICE<sup>1</sup>*Entitled to hospital relief and other benefits**Foreign seamen and nonbeneficiary seamen.*

(Act Mar. 3, 1875.)

*Personnel of the Army.*

(Departmental agreement. Executive order Apr. 3, 1917.)

*Personnel of Navy and Marine Corps.*

(Act Mar. 3, 1875, departmental agreement, Executive order Apr. 3, 1917.)

*Immigration patients.*

(Current appropriation acts. Departmental agreement and Bureau Circular fixing annual rates.)

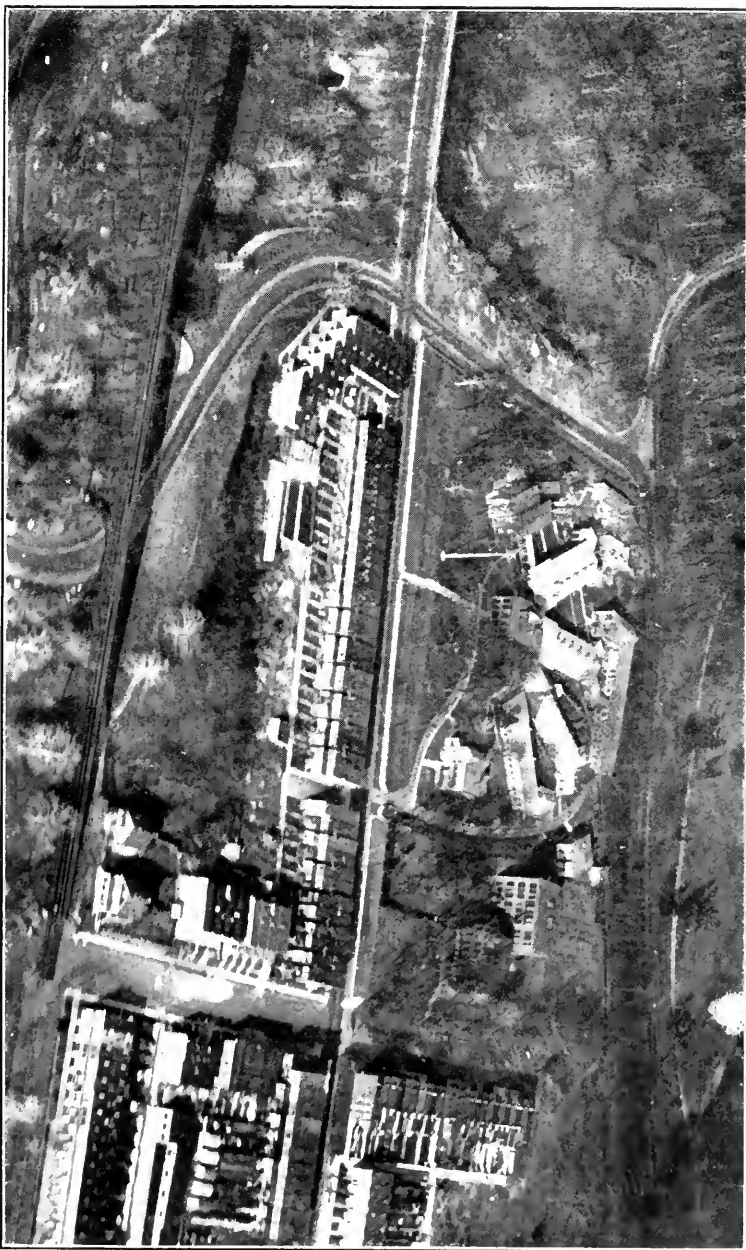
*United States Veterans' Bureau patients.*

(Acts Oct. 6, 1917, Mar. 3, 1919, Dec. 24, 1919, Mar. 4, 1921, Aug. 9, 1921, and current appropriation acts.)

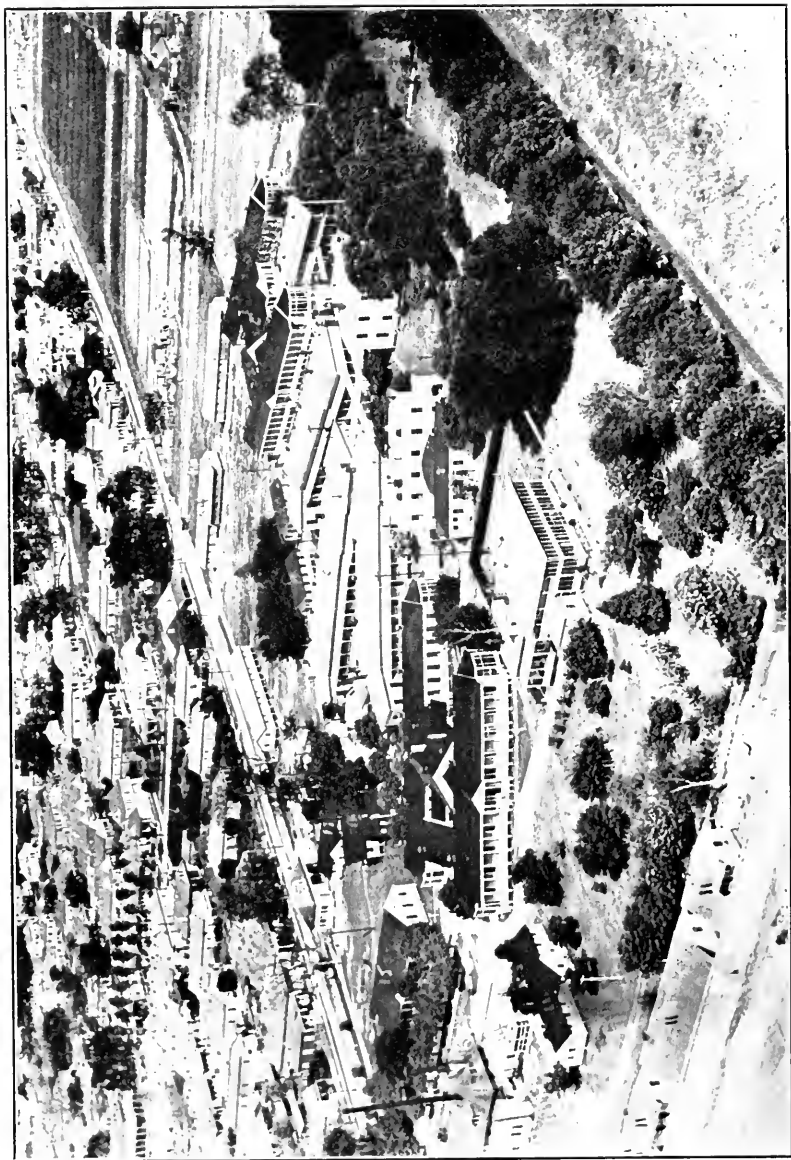
## UNITED STATES EMPLOYEES' COMPENSATION COMMISSION

Civil employees of the United States injured, or otherwise disabled, as a result of such employment become patients of the United States Employees' Compensation Commission. For their care, the marine hospitals and other relief stations of the United States Public Health Service are available and, when convenient to the need, are utilized. During the year, 37,265 patients, or 22.8 per cent of the total number treated, were from the Employees' Compensation Commission. A total of 43,423 hospital days were supplied. Out-patient treatments numbering 121,904, or 30 per cent of all such treatments given, were furnished to this class of beneficiaries. (See Table 3, p. 226.)

<sup>1</sup> All funds received are returned to the General Treasury, except those alone for patients of the U. S. Veterans' Bureau, which are reexpended by the Public Health Service.



U. S. MARINE HOSPITAL NO. 1, BALTIMORE, MD.



U. S. MARINE HOSPITAL NO. 14, NEW ORLEANS, LA.



U. S. MARINE HOSPITAL NO. 19, SAN FRANCISCO, CALIF.



There is no exchange of funds between the Employees' Compensation Commission and the Public Health Service on account of relief provided. The following excerpts from a letter dated April 10, 1924, received from the chairman of the Employees' Compensation Commission, are of interest as bearing upon the economies effected by the use of the facilities of the Public Health Service and the efficiency of the services thus supplied:

In reply to an inquiry from the Bureau of the Public Health Service, I am pleased to inform you that the average total per diem cost to the commission for the hospitalization of its beneficiaries not treated by the Public Health Service during the year 1922 is \$5.93. This figure includes all medical charges while in hospitals, in so far as it corresponds to the hospital services furnished beneficiaries of the commission under treatment at marine hospitals. I wish to state, however, that the commission realizes that the services rendered by the marine hospitals are far more complete than the commission feels warranted in authorizing for its beneficiaries in private hospitals, as the detailed laboratory analyses and supplementary reports of consulting specialists furnished by the Public Health Service could not be procured by the commission at private hospitals, except at prohibitive cost. The figure for 1922 is quoted as probably the lowest since the commission has been in operation.

The average per diem cost for beneficiaries of the commission treated outside of hospitals by private physicians in 1922 is \$1.40. This figure is by no means the average cost per treatment, but is derived by dividing the total medical bills by the number of days under treatment, and for this reason should not be compared with the per diem cost of dispensary operation. The actual cost per visit to private doctors and dispensaries, including examinations, consultations, laboratory fees, and X rays, would probably exceed \$3 per visit. Here again the commission feels that the services rendered by private physicians in their offices are in no way comparable to the unusually complete examinations and treatments available at Public Health Service dispensaries.

#### UNITED STATES COAST GUARD

For the personnel of the United States Coast Guard, numbering 4,882, medical and hospital care was provided, which amounted to 36,504 hospital days, 45,857 out-patient treatments, and 7,008 physical examinations. This amounts to 3 per cent of the total number of hospital days for all beneficiaries, and 11 per cent each of out-patient treatments and physical examinations. Treatment was given at 23 marine hospitals, 40 contract hospitals, 70 other relief stations, and at a large number of isolated life-saving stations. Eighteen medical officers were detailed to exclusive duty with the Coast Guard for service aboard cruising cutters and at important shore stations, and 95 contract physicians furnish relief exclusively for Coast Guard personnel at stations remote from other classes of beneficiaries.

The additional functions imposed upon the Coast Guard in enforcing the laws relating to prohibition are expected to double its personnel and more than double its needs for medical and hospital care. In addition to the increased demands which it is anticipated will be made on hospitals and other relief stations, the Commandant of the Coast Guard estimates a need of 10 additional commissioned officers for exclusive duty with the Coast Guard, and not less than 18 additional dispensaries ashore. It is anticipated that it will be necessary to equip 22 additional cruising cutters with medical and surgical supplies, the same being routinely furnished to all cutters and other Coast Guard units by the Public Health Service.

Surg. J. M. Gillespie has been continued as medical aide to the Commandant at Coast Guard Headquarters, and acts as liaison officer with the Public Health Service.

#### UNITED STATES VETERANS' BUREAU

Patients of the United States Veterans' Bureau were given a total of 87,003 hospital days in marine hospitals and other relief stations, and 2,603 out-patient treatments, while 1,016 physical examinations were rendered. Twenty of the marine hospitals were utilized in these transactions, those most extensively used being the smaller ones located in cities remote from hospitals of the United States Veterans' Bureau. Approximately one-half of these patients were admitted for observation to determine a doubtful diagnosis. Of those admitted for treatment, the majority were medical cases, but surgical operations included appendectomies, thyroidectomies, amputations, herniotomies, and tonsillectomies. There was a slight diminution during the year of the total number of patients under treatment belonging to this class. As the year closes, however, it becomes apparent that the new legislation, the World War veterans' act of 1924 (Public, No. 242, 68th Cong.), by adding new classes of beneficiaries to patients of the United States Veterans' Bureau, has created new problems of hospital care which may require a greater use of the marine hospitals when their facilities permit.

#### UNITED STATES SHIPPING BOARD

In addition to the medical and hospital relief provided seamen from vessels of the United States Shipping Board, to which relief they are entitled because of their status as American seamen, the crews of its vessels have been examined by request in certain ports immediately prior to sailing. This, it has been found, is greatly in the interests of the health and efficiency of the crews of the vessel, and it is also designed to reduce the number of unjust claims for compensation to which these vessels, because operated by the United States Government, are liable. Within a period of slightly more than a year the crews of 110 vessels (2,750 seamen) were examined aboard ship in Galveston. In New Orleans the crews of 197 vessels (4,153 seamen) were so examined, and in Mobile the crews of 112 vessels (2,213 seamen).

#### MEDICINAL LIQUORS AND DRUGS FOR VESSELS AND MISCELLANEOUS FUNCTIONS

The marine hospitals and other relief stations of the Public Health Service have continued to assist in the application of laws governing the possession aboard ships of medicinal liquors and drugs. Certificates of need numbering 4,234 for medicinal liquor on foreign and domestic vessels in United States ports were issued during the year, the quantities and kinds of liquors necessary being specified in each instance. Purchase orders for drugs, the procurement of which requires a special permit in accordance with Federal narcotic laws, were issued when the same were found necessary upon application from the masters of vessels having no medical officers aboard.



Examinations were made for the United States Steamboat Inspection Service of vision and color vision of 5,698 applicants for license as master, mate, pilot, and engineer.

The number of general physical examinations made for the United States Civil Service Commission has increased to the point where this function is a considerable item at all large stations. Practically all entrants to the civil service in localities adjacent to stations of the Public Health Service are there examined. Upon reference to Table 3 (p. 227) it will be seen that 15,679 such examinations were made during the year.

### OPERATING COSTS IN MARINE HOSPITALS

A further reduction in operating expense has been effected. The per diem cost per patient, which in 1922 was \$4.10 and in 1923 was \$4.08, averaged \$3.89 for the fiscal year 1924. The cost of the ration, which was 67 cents and 66 cents, respectively, in the two preceding years, averaged 68 cents. There has been no noticeable decrease in the general costs of labor or commodities, and economies have therefore been effected by constant attention to details of expenditures and sometimes by decided retrenchments in matters which reflect less intimately the satisfaction of patients than does the daily ration, but are perhaps no less vital to general hospital efficiency. As set forth in last year's report (pp. 210-212), the costs of operating marine hospitals are lower than those of civil institutions furnishing the same character of services. The advancement in all hospital operating costs since the pre-war period is common knowledge. A large steamship company which owns and operates for the care of its own seamen a line of hospitals in foreign countries where the Public Health Service does not provide relief, mentions in its annual report of 1923 that the average per diem costs of representative hospitals advanced in New York from \$2.55 in 1912 to \$5.15 in 1922, and in Chicago from \$2.49 to between \$5 and \$5.87 during the same period.

As will be seen on reference to Figure 2, the lowest operating cost, \$3.03 per patient per day, was at the marine hospital, San Francisco, which also had the largest number of relief days, 104,517, with the exception of the hospital at Ellis Island, where the costs are higher, chiefly because of the irregularity of the demands made upon it. The highest operating cost, \$6.63 per patient per day, is found in the marine hospital, Key West, Fla., which gave the smallest number of relief days, 6,472. It is natural that a large hospital will be able, in time of financial stress, to effect more economies than a small hospital, which, like that at Key West, has but one medical officer and whose other personnel is minimal. It follows also that a hospital with all its beds constantly filled and sometimes taxed beyond its normal capacity will show a low operating cost; but this is by no means a matter for congratulation. It only reflects heroic efforts to meet the obligations imposed upon it with the least possible impairment of efficiency. The proper cost of hospital personnel (salaries) is generally considered to be from 41 to 55 per cent of the total operating costs. This item is seen to be within the conventional limits in marine hospitals, although it includes the salaries of all commissioned and other officers, salaries and fees of attending specialists, and the wages of all personnel, including those who, as at Fort Stanton, are employed

in the production of station products, which reduces the cost of the ration.

The low costs of operation shown for many of the marine hospitals, especially those less than \$4 per day, were the result, in some instances, of forced and undesirable economies. They were necessary to keep expenditures within the appropriations and at the same time meet the increasing demands for relief from the various classes of authorized beneficiaries.

#### PUBLIC HEALTH SERVICE SUPPLY DEPOT AT PERRY POINT, MD.

Surplus property accruing from division of stock with the United States Veterans' Bureau is stored at this station, of which Associate Medical Purveyor C. H. Bierman is in charge. Its prime purpose is to distribute this surplus property. Its diminishing stocks have, however, been replenished from time to time by purchases of commonly used but exhausted supplies. The surplus stock has been considerably reduced during the year, other governmental agencies, St. Elizabeths Hospital, National Homes for Disabled Volunteer Soldiers, Federal penitentiaries, Yellowstone National Park, the Bureau of Supply, etc., having participated, as matters of general Federal economy, in the use of the same to the value of \$31,504.11.

#### ECONOMIES IN THE PROCUREMENT OF MEDICAL AND HOSPITAL SUPPLIES

All requisitions from field stations for supplies and equipment are first cleared through the supply depot at Perry Point, Md. No article has been purchased for which a reasonable substitute was in stock. The value at invoice prices of the surplus supplies and equipment furnished to hospitals and relief stations from Perry Point during the year amounted to \$238,008.64. This material included large quantities of supplies in every-day hospital use, such as beds, bedding, towels, gauze, absorbent cotton, bandages, drugs, dental supplies, hospital clothing, tools, and surgical instruments.

Another important measure which has resulted in large economies in the use of current funds was the procurement direct from Army depots of additional surplus supplies, which were sent direct to field stations. The sales value of this material, according to Army estimates, amounted to \$21,312.71 and its original cost was \$94,606.47. Among the supplies last mentioned were clothing (for leper patients), dairy and farm implements, plumbing and electrical supplies, automobile tires and tubes, and some subsistence supplies. The most important articles thus secured, however, were forty  $\frac{3}{4}$ -ton motor vehicle chassis with Army-type ambulance bodies, which were converted, by station labor, into light trucks for hospital and quarantine use. Twenty-six ambulances were also converted to hospital use by procurement of commercial bodies to fit other  $\frac{3}{4}$ -ton chassis received from Army surplus. It should be mentioned that there is a serious deficiency in passenger-carrying vehicles at the hospitals, no funds having ever been available for their purchase. The used touring cars secured from the Army shortly after the war are now worn and dilapidated.

A third expedient to reduce expenditures was the transfer of equipment and supplies needed by one hospital, from another station

where, by reason of changed conditions, they were no longer required. All stations are routinely required to report surplus items, and hospitals are sometimes circularized for certain needed articles, to the end that waste may be prevented and a spirit of economy cultivated. Property valued at \$13,340.51 was so transferred during the year and immediately utilized. This includes certain special appliances not constantly used and other equipment outgrown by large hospitals but usable in smaller ones.

### SUPPLIES AND EQUIPMENT PURCHASED

Notwithstanding the large amounts of surplus stock consumed, it was necessary to purchase, through the Bureau of Supply, considerable quantities of hospital supplies, as shown in the following table:

Key No.	Description	Amount
0200	Stationery and office supplies.....	\$16,283.31
0210	Medical and hospital supplies.....	33,263.30
0220	Scientific and educational supplies.....	3,434.76
0240	Wearing apparel and sewing supplies.....	14,807.42
0280	Sundry supplies.....	17,262.58
0290	Materials (not specifically allocated for use as supplies, equipment, or structures at time of purchase).....	6,761.56
3000	Passenger-carrying vehicles (accessories and repair parts for).....	13,935.39
3010	Furniture, furnishings, and fixtures.....	93,866.47
3020	Educational, scientific, and recreational equipment.....	48,698.21
3050	Other equipment.....	23,580.37
	Total.....	271,893.37

Classifications and key numbers are those of the General Accounting Office Bulletin No. 1, of May 11, 1922.

Nothing better illustrates the complexity of a modern hospital than the quantity and variety of supplies required by it. The considerable expenditures for wearing apparel and sewing supplies resulted chiefly from the necessity of providing clothing and shoes for approximately 200 male and female leper patients at Carville. As the surplus stock dwindles, the expenditures for supplies must necessarily increase.

### CONTRACT HOSPITALS

Contracts with 109 hospitals were in force at the end of the fiscal year for the care of beneficiaries at second, third, and fourth class relief stations remote from marine hospitals, and for classes of beneficiaries for which the service lacks accommodations. Of the 3,282 patients remaining in hospitals on June 30, 1924, 526 were in contract hospitals, including 165 insane patients, of which 108 are at the Government Hospital for the Insane, Washington, D. C., 40 in State-owned asylums on the Pacific coast, and 15 (patients of the Veterans' Bureau) in Porto Rico.

The average rate paid for hospital contract care (food and ward nursing) for noncontagious cases was \$2.81 per day. When to this is added the due proportion of the salary of the medical officer engaged to treat these patients in hospital, fees for X ray and other laboratory procedures, use of the operating room, and special nurses when required, the average cost per diem for contract care in hospitals for general and surgical cases is \$4.33. This is more than the cost of care in marine hospitals; and although the contract institutions

employed are representative hospitals, they can not be, for the Government's purposes, as satisfactory as the marine hospitals.

*United States marine hospitals, fiscal year 1924: Historical and miscellaneous data*

Number and location of hospital	Year in which relief activities were begun at the port	Year present hospital was built or acquired	Original capacity	Present capacity	Maximum number of patients	Daily average of patients	Attending specialists	Medical officers and internes	Dentists	Nurses, aides, and dietitians	All other personnel
1. Baltimore.....	1802	1887	60	167	175	137	10	8	1	21	63
2. Boston.....	1798	1860	100	170	169	136	9	8	1	15	50
3. Buffalo.....	1873	1909	48	60	72	63	9	4	1	11	27
5. Chicago.....	1852	1873	92	125	152	122	7	7	1	19	65
6. Cleveland.....	1852	1852	72	83	88	77	2	5	1	13	39
7. Detroit.....	1857	1857	40	80	81	71	4	3	1	13	36
8. Evansville.....	1856	1892	40	48	51	38	3	2	---	5	18
9. Fort Stanton.....	1899	1899	250	261	227	213	---	6	1	14	115
10. Key West.....	1840	1845	50	40	28	18	---	1	---	5	11
11. Louisville.....	1847	1856	34	60	70	51	5	3	---	7	24
12. Memphis.....	1870	1884	12	50	41	27	7	2	---	5	22
13. Mobile.....	1834	1840	30	80	83	71	3	4	1	10	30
14. New Orleans.....	1802	1885	61	250	303	201	6	10	2	30	98
15. Pittsburgh.....	1851	1910	39	60	57	46	---	3	---	8	22
16. Portland.....	1802	1859	19	42	42	28	9	2	---	4	18
17. Port Townsend.....	1855	1895	65	102	101	91	---	4	1	12	32
18. St. Louis.....	1840	1882	73	70	76	56	13	4	1	7	32
19. San Francisco.....	1849	1875	130	320	311	286	1	13	1	42	99
20. Savannah.....	1873	1906	38	85	88	74	5	4	1	9	31
21. Stapleton.....	1802	1883	143	288	305	277	13	13	---	33	150
22. Vineyard Haven.....	1798	1895	24	24	28	20	1	1	---	2	7
43. Ellis Island.....	1802	1919	340	662	567	340	(1)	13	---	55	206
66. Carville.....	1921	1921	100	213	200	177	3	3	1	12	115
70. Hudson Street, New York <sup>2</sup> .....	1802	1919	20	23	23	20	(1)	4	5	21	75
82. Norfolk.....	1798	1919	213	217	197	155	3	6	2	23	88
Cairo, Ill. <sup>3</sup> .....	1865	1885	32	---	---	---	---	---	---	---	---
Wilmington, N. C. <sup>3</sup> .....	1859	1861	17	---	---	---	---	---	---	---	---

<sup>1</sup> Same consultants available to hospitals 21, 43, and 70.

<sup>2</sup> Hospital No. 70 is a large out-patient dispensary having emergency beds only.

<sup>3</sup> Closed.

With the exception of the hospitals at Fort Stanton, N. Mex., and Carville, La., reserved for tuberculous patients and lepers, respectively, all marine hospitals are devoted to general medical and surgical patients. Tuberculous patients unsuitable for transfer to Fort Stanton are provided for in special wards at all marine hospitals; but aside from these, comparatively few with chronic disease are under treatment. The hospital at Ellis Island, devoted chiefly to immigrants, has, as would be expected, the highest "turn over" and the lowest average stay, 11½ days. Fort Stanton and Carville, with essentially chronic patients, show a very long duration of treatment in those discharged during the year, 381 and 1,984 days, respectively. The acuteness of the general service may be seen in the total number of deaths, 882 (in marine hospitals alone 689), and the short average stay, which, for those discharged during the year was 32 days at Stapleton, and 46½ days at San Francisco, two representative hospitals. The duration of treatment naturally averages longer than in private hospitals, because patients in marine hospitals are usually retained until fit for duty aboard ship, instead of merely convalescent.

A further evidence of the active service in the hospitals is seen in the number and diversity of the surgical operations performed and the extent of the laboratory examinations reported.

*Surgical operations performed at United States marine hospitals and other relief stations, fiscal year 1924*

Name of operation	No.	Name of operation	No.
Adenoidectomy	38	Joint dislocation:	
Amputation, all or in part	219	Closed reduction	45
Appendectomy	509	Open reduction	8
Arthrodesis	44	Laminectomy	10
Arthroplasty	7	Litholapaxy	4
Arthrotomy	27	Lithotomy, perineal	1
Arsphenamine injection	6, 953	Lithotomy, suprapubic	3
Arsphenamine-neo, injection	16, 241	Liver, operations on (otherwise unclassified)	4
Aspiration and injection	225	Lymphadenectomy	192
Blood vessels, operations on (otherwise unclassified)	12	Mastoidectomy	55
Bone graft	8	Nephrectomy	3
Bone plate, removal of	13	Nephrorrhaphy	146
Bone rebroken and set for faulty union	8	Nephrotomy	6
Bone, resection of	9	Neurotomy	7
Brain, operations on (otherwise unclassified)	7	Obstetrics labor	26
Breaking up of adhesions	16	Orchidectomy	19
Cataract extraction	12	Osteotomy	55
Cauterization	912	Paracentesis (otherwise unclassified)	63
Celiotomy	70	Phlebectomy	46
Chalazion operation	19	Plastic repair	89
Cholecystectomy	39	Pneumothorax, artificial	165
Cholecystotomy	9	Proctectomy	1
Chondrectomy	4	Prostatectomy, perineal	17
Circumcision	580	Prostatectomy, suprapubic	21
Colectomy	1	Pterrgium, operation for	26
Curettement	35	Puncture for exploration, drainage, etc.	851
Cystoscopy	537	Repair (otherwise unclassified)	64
Cystotomy, perineal	4	Resection (otherwise unclassified)	101
Cystotomy, suprapubic	18	Sequestrotomy	39
Debridement	5	Sinusotomy	49
Decompression	7	Spinal injection	13
Decortication	2	Spinal puncture	663
Dilatation	1, 896	Stomach operations	7
Enterostomy	8	Submucous resection	241
Enucleation, simple	29	Suture	716
Epididymectomy	12	Suture, secondary	33
Epididymotomy	40	Tendon transplantation	3
Excisions	854	Tendons, operation (otherwise unclassified)	7
Excisions and drainage	295	Tenoplasty	21
Extirpation of lacrimal sac	47	Tenosynovectomy	3
Extraction of tooth	13, 239	Tenotomy	18
Eye operations (otherwise unclassified)	27	Thoracentesis	26
Foreign body, removal of	1, 730	Thoracoplasty	5
Fracture, closed, reduction of	742	Thyroidectomy	14
Fracture, compound, reduction of	154	Tonsillectomy	1, 362
Fracture, open, reductions of	101	Tracheotomy	3
Gastroenterostomy	31	Transfusion	34
Hemorrhoids	396	Turbineotomy	70
Hernia, femoral, repair	18	Undescended testicle, operation for	5
Hernia, inguinal, repair	1, 001	Urethrotomy, external	62
Hernia, umbilical, repair	12	Urethrotomy, internal	39
Hydrocele, eversion or excision	101	Varicocele	172
Incisions and drainage	4, 586		
Intestines, operations on (otherwise unclassified)	7	Total	57, 551
Iridectomy	11		

*Consolidated clinical laboratory report fiscal year 1924, United States marine hospitals*

Blood:		Stomach or duodenal contents:	
Complement fixation—		Routine.....	272
Syphilis.....	23, 244	Special.....	136
Gonorrhea.....	19	Spinal fluid:	
Erythrocyte counts.....	1, 595	Wassermann.....	701
Leucocyte counts.....	3, 301	Colloidal gold reaction..	179
Differential leucocyte		Globulin test.....	588
counts.....	2, 980	Cell count.....	422
Malaria.....	1, 738	Bacteriological examina-	
Typing.....	98	tion.....	28
Blood cultures.....	176	Other examinations.....	37
Chemical determina-		Bacteriological examinations:	
tions—		Pus.....	472
Carbon dioxide (Van		Exudates.....	245
Slyke or similar).....	3	Discharges—	
Creatinine.....	37	Urethral.....	12, 786
Incoagulable nitro-		Other.....	619
gen.....	9	T. pallidum—	
Sugar.....	609	Dark field.....	1, 128
Urea nitrogen.....	269	Smear.....	623
Uric acid nitrogen.....	67	Throat smears.....	944
Total nitrogen.....	227	Throat cultures—	
Hemoglobin.....	1, 379	Routine.....	1, 286
Chlorides.....	185	Special.....	59
Unclassified.....	85	Cultures.....	457
Coagulation time.....	449	Bacteriological counts.....	178
Urine:		Typhoid and paratyphoid ex-	
Urinalyses—		aminations:	
Routine.....	37, 637	Agglutination tests.....	334
Special.....	2, 502	Feces.....	133
Renal function tests.....	540	Urine.....	107
Quantitative sugar.....	1, 946	Animal inoculations: For diag-	
Feces:		nosis.....	251
Parasites and ova.....	2, 573	Pathological examinations:	
Dysentery—		Autopsies.....	82
Entamebic.....	349	Tissue examinations.....	191
Bacillary.....	16	Vaccines: Autogenous.....	136
Occult blood.....	425	Miscellaneous examinations:	
Sputum:		Otherwise unclassified....	4, 410
Tubercle bacillus.....	22, 789	Total examinations....	132, 236
Pneumococcus.....	140		
Other organisms.....	45		

## PHYSICAL EXAMINATIONS

Of 62,709 persons examined physically during the year, 2,991 were rejected as unfit for the duties proposed. It is of importance to state, however, that for certain classes of patients examined, such as those of the Veterans' Bureau, the Employees' Compensation Commission, and civil-service applicants, it is not the function of the medical officer to reject, but merely to make a true report.

Among important classes of patients examined are Coast Guard personnel, of whom 818, or more than 10 per cent of those examined, were rejected, and American seamen, 1,099 rejections. The most frequent cause for rejection was defective vision, 933; color blindness, 261, ranked third. Average vision and accurate color sense which will enable the mariner to distinguish between red and green lights are, of course, exceedingly important, especially among coast guardsmen and those who apply for license to navigate ships. Venereal disease accounted for 412 rejections; heart disease, 220; and hernia, 199.

## ATTENDING SPECIALISTS

In recognition of modern developments in medicine and surgery, attending specialists are now available for duty at all important marine hospitals. To perform a difficult surgical operation, assist in diagnosis of an obscure case, or consult with the hospital staff regarding treatment, surgeons and physicians representing the highest talent in the vicinity are now available. There is a total of 148 attending specialists, of whom 61 serve as a courtesy to the Government at the nominal remuneration of \$1 a year, and 32 are on a fee basis. The remainder serve at salaries which average \$80 per month. The total salaries and fees paid attending specialists is approximately \$64,400 per annum. This expenditure is primarily to improve the treatment, but it is also in the interest of economy, since it shortens the length of stay in hospital and often makes it possible to omit from the staff full-time medical officers in a single specialty.

## RÖNTGENOLOGY

The importance of the X ray in daily routine work is apparent from the following:

*Consolidated X ray report, fiscal year 1924, United States marine hospitals*

Total number of patients examined.....	23, 618
Number of exposures made:	
Bone and joint.....	21, 694
Chest.....	10, 499
Dental.....	10, 349
Gastrointestinal and urogenital tracts.....	4, 727
Miscellaneous.....	2, 487
Total.....	49, 756

Only a few years ago this agent was used only occasionally, and, because of the limitations of machines then in use, chiefly for the detection of fractures and dislocations. At the present time powerful machines are in daily use in the diagnosis of diseases of the chest, mouth, and genitourinary and gastrointestinal tracts, as well as in diseases and injuries of the bones and joints. The costs of the X ray films alone during the year, a minor part of the total expense, was \$10,102.64.

## DENTISTRY

In recognition of its place in medicine, dentistry has been introduced into all the marine hospitals and is available at 21 other relief stations. Two dentists are assigned to duty with the Coast Guard. There are now 25 full-time dental officers, of whom 14 are commissioned, and 29 part-time contract dentists, the latter serving the smaller marine hospitals and other relief stations.

During the year, dental relief aggregated 13,239 extractions, 6,919 prophylactic treatments, 14,268 fillings, 11,117 complete dental examinations, and the construction of 3,727 prosthetic appliances. Twenty-five cases of fractured jaw were brought to the dentists for assistance in treatment. Dentistry in the marine hospitals adds an average cost of 5½ cents per day to the care of patients. The entire expense for the year at all hospitals and relief stations, where full-time dental officers were employed, including salaries, materials, and supplies of every kind, amounted to \$101,720.62, or less than one-half the cost at commercial rates.

## REPAIRS AND IMPROVEMENTS

The marine hospitals are not in a state of good repair. Necessary economies during the year have prevented the Supervising Architect from undertaking many projects recognized as essential. The total amounts requested in 1924 for major repairs at 11 marine hospitals aggregated \$537,000. Of this amount the Bureau of the Budget approved and recommended the appropriation of \$324,190. There was appropriated, however, by the Congress, only \$92,500 to be expended at five hospitals. Major improvements which were accomplished during the year, chiefly from other and special appropriations available for the purposes, included the construction of an 85-bed wing at the marine hospital, Savannah, Ga., which was completed and equipped during the year, practically doubling the capacity of that institution. At the marine hospital, Baltimore, a small building was erected for medical officers' and pharmacists' quarters, garage space was enlarged, and an effective fire-alarm system installed. At Key West, contracts were placed for a salt-water fire supply to conserve fresh water and to replace fire protection withdrawn by the municipality. At Mobile, a frame dwelling was erected for medical officers' quarters and the hospital building was extensively remodeled; X ray rooms, dental clinic, laboratory and physiotherapy space were provided. At the marine hospital, Stapleton, N. Y., the newly completed mess hall and kitchen building was equipped and occupied. At Chicago new laundry machinery of modern type was installed.

The great and increasing fire hazards, especially at Baltimore, New Orleans, and San Francisco, where the entire construction is of highly inflammable material, is a cause of constant concern. These hazards at other important hospitals are also inordinate. Considerable appropriations will be required to permit the construction necessary to obviate these risks.

Inspection Engineer David C. Trott has been continued by the Supervising Architect to be detailed to the Public Health Service, in charge of matters relating to maintenance, repairs, and construction.

EXAMINATION AND INSTRUCTION OF SHIPS' OFFICERS IN  
"FIRST AID"

All candidates for license as master, mate, pilot, or engineer are required by the United States Steamboat Inspection Service to secure a certificate from an officer of the Public Health Service, for acuity of vision, color vision, and hearing, and also for proficiency in the principles of first aid. This latter requirement, which was introduced July 1, 1922, resulted from the pressing need for intelligent first-aid attention on ships carrying no physicians. To render proper assistance the Public Health Service designated 43 of its hospitals and other relief stations to conduct lecture classes and make examinations in first-aid proficiency. These lectures are simple and practical. The use and application of commonly used drugs and appliances are explained and demonstrations are given of the dressing of wounds, treatment of fractures, resuscitation, etc.

During the year, 1,967 candidates were given class and individual instruction, 2,758 were examined, and 2,474 passed. The aggregate of time devoted by the various medical officers to this work amounted to 4,932 hours, of which 2,792 hours were devoted to instruction and 2,140 to the required examinations.



## RADIO MEDICAL ADVICE TO SHIPS AT SEA

This service has been continued in cooperation with commercial and governmental radio stations. All radio messages of this character are transmitted to marine hospitals free of charge and answered in the same manner. The marine hospitals especially designated and most commonly used are those located respectively in New York City, Key West, New Orleans, San Francisco, and Cleveland. The number of messages received during the year shows a considerable increase over last year's transactions.

## MODEL SHIP'S MEDICINE CHEST

To facilitate first aid at sea and to standardize equipment aboard ships, especially ocean-going vessels without physicians aboard, a model ship's medicine chest was designed and constructed. It was exhibited at the Marine Congress and Exposition in New York City and is described in drawings and specifications which are furnished, upon request, to ship owners and masters applying for them.

## SPECIAL AND REPRESENTATIVE MARINE HOSPITALS

A brief abstract from the annual reports of a few individual hospitals is here given, the institutions selected being those devoted to special purposes or offering some features of special interest in their transactions.

*Marine Hospital No. 66, Carville, La.*—This institution, which is the National Leper Home, was enlarged during the year by the construction of 20 patients' cottages, accommodating an aggregate of 240 patients, a kitchen and mess hall, with seating capacity for 500, a large storehouse for subsistence supplies, with refrigerating facilities and bakeshop, new power house, incinerator, and two double sets of officers' quarters. The total capacity of the institution (425) will not, it is estimated, provide for more than approximately half of the lepers believed to be in the country. An infirmary building for the care of the blind, maimed, and otherwise helpless patients, including those acutely ill with intercurrent affections, is needed, as is also a physiotherapy building for diversional occupation.

Delay in supplying facilities for necessary additional water supply has postponed the full use of these buildings beyond the end of the fiscal year, but lepers on the waiting list are now being moved from various parts of the United States to Carville. Of the 200 patients under treatment June 30, 1924, 149 were males. The ages of patients range from 4 to 43; 6 are less than 15 years of age. One hundred thirty-three were born in the United States, and 67 in the countries listed below. None of these is a deportable alien.

Mexico.....	5	Hungary.....	1
Central America.....	1	France.....	1
Canada.....	1	Spain.....	1
Philippine Islands.....	5	Portugal.....	4
West Indies.....	2	Italy.....	7
Hawaiian Islands.....	2	Turkey.....	2
Porto Rico.....	3	Greece.....	9
British Guinea.....	1	India.....	2
Russia.....	2	Palestine.....	1
Finland.....	2	China.....	12
Germany.....	2	Korea.....	1

There are at present in the hospital 11 World War veterans and 7 Spanish War veterans. The former are believed to have contracted leprosy prior to induction, the diagnoses having been made while in active service or soon after discharge. Of the Spanish War veterans, all are presumed to have contracted infections while serving in tropical or subtropical countries.

The majority of lepers under treatment have the disease in advanced stages. The facilities of the hospital have not been sufficient to admit more than a small percentage of applicants, and selection has been made of patients presenting the greatest hazard to the communities where they are found. Of 44 admissions during the year, 37 were advanced and only 7 early cases. The large majority of those admitted were incapable of self-support. Many were so mutilated by their infection that employment was not practicable. Twelve patients died during the year; their bodies were interred in the station's cemetery. Blindness is an exceedingly frequent complication, about 13 per cent of the patients at Carville being totally blind. An attending specialist skilled in diseases of the eye has visited the hospital at regular intervals and operated on many patients. Many cases of blindness have thus been prevented and considerable improvement has been effected. An attending specialist in neuropsychiatry has prescribed treatment for the mental and nervous disorders so frequent in this disease. A full-time dentist who devotes himself exclusively to leper patients has also ameliorated conditions which were distressing.

The number of patients absconding from this hospital has diminished to an almost negligible quantity. During the past year four patients absconded, the smallest number in 22 years. Of these, three were pensioners of the Government as ex-soldiers, drawing compensation with but small opportunity to dispose of their incomes, and the fourth was a young man suffering from homesickness. A large percentage of the lepers absconding in past years have returned voluntarily, because in the absence of hospital treatment the patient becomes rapidly worse, and because of an intolerance to lepers encountered in most communities. While the movements of patients are restricted to the buildings and grounds set aside for their use, confinement is never practiced at Carville, except in a few instances in which absconders upon being returned against their will are known to contemplate again leaving the institution in defiance of the laws governing their segregation.

Treatment offers many encouraging results. During the past four and one-half years the use of chaulmoogra oil has been continued and improvement has been noted in some cases, especially among negroes. X ray treatments have been tried, and although of doubtful value in skin lesions, have yielded encouraging results in nerve involvements, and are especially useful in relieving the pain of acute neuritis, a troublesome complication in leprosy, so severe as sometimes to call for the use of morphine. The most encouraging results have been obtained during the past year through the use of a mercurial preparation, which has so far been administered to 44 patients, of whom 11 have been markedly improved, 11 moderately improved, 8 slightly improved, 10 found unchanged, and 4 have become worse. Of these patients, 36 were advanced and 8 were early cases.

Two unsalaried chaplains, one Catholic and one Protestant, have been on duty during the year, chapels having been provided without

expense to the Government for their use. Through the generosity of the American Mission to Lepers and the personal interest of Mr. W. M. Danner, secretary to the mission, there is being constructed without expense to the Government a new Protestant chapel of hollow tile, concrete, and stucco, with a seating capacity of 250. This building is of Gothic design and the most imposing structure on the reservation, having a general auditorium, a balcony for the use of "clean" personnel, and two community rooms for special uses. A serious problem is the furnishing of suitable recreation and occupation for patients who recognize that they are hospitalized for an indefinite period, possibly for life. Plays by amateur talent from neighboring schools, colleges, and other organizations, baseball games, entertainments and dances, and picnics arranged among the patients themselves, have been found helpful in maintaining the excellent morale.

*Marine Hospital No. 9, Fort Stanton, N. Mex.*—This hospital, which is located 6,230 feet above sea level, is admirably adapted for the treatment of patients with tuberculosis not too far advanced. Those with far advanced or rapidly progressing disease, or with certain complications, are sometimes adversely affected by the climate and are therefore retained, in their own interests, in local marine hospitals. Of 426 tuberculous patients in marine hospitals on June 30, 1924, 214 were at Fort Stanton, the others being unsuitable for transfer or unwilling to be sent.

The total number of patients treated here during the year was 361, of whom 318 were merchant seamen. The average stay of patients discharged was 381 days. The chief reliance in treatment is not placed upon climatic conditions, but upon the commonly accepted sanatorium regimen. The low humidity and high percentage of sunshiny days are useful, however, in applying the open-air treatment. Heliotherapy is used extensively for tuberculosis of the bones, joints, glands, and peritoneum, and with good results. Artificial pneumothorax in selected cases is used with benefit to many of those so treated. Occupational therapy as an adjunct to treatment is useful; weaving, basketmaking, and metal work are carried on. This not only diverts the minds of the patients from physical ailments but reestablishes confidence in themselves and improves the morale. As a part of occupational therapy, classes are conducted in English, spelling, bookkeeping, and arithmetic.

There are two unsalaried chaplains, a Protestant and a Catholic, and welfare work is also carried out by the Knights of Columbus, the Young Men's Christian Association, and the Seamen's Church Institute.

By reference to Figure 2 (p. 217) it will be seen that the cost of the ration at Fort Stanton was reduced from 79 cents per day to 42 cents per day, by the use of station products. This hospital, having a reservation of 43 square miles, is able to conduct farm and range operations which supply the station with beef, pork, and dairy products at a considerable profit of operation. There were produced during the year 64,995 gallons of milk, 106,104 pounds of beef, 41,948 pounds of fresh pork, and 10,226 pounds of ham and bacon. The actual cost of production at the station, including wages, forage, rations of men, fencing, and all other expense, was for milk 32 cents per gallon, beef 15 cents per pound, fresh pork 12 cents per pound,

ham and bacon 15 cents per pound. Surplus livestock amounting to 40 head of steers, 31 dairy animals, and 3 carloads of hogs, was transferred to Carville during the year, and 110 animals were sold at public auction, the receipts for which aggregated \$2,839.50.

*Marine Hospital No. 14, New Orleans, La.*—The marine hospital at New Orleans has witnessed a phenomenal growth in clinical work during the year, due presumably to increased shipping activities in that port, 82 per cent of all patients being merchant seamen. The number of patients has steadily increased from 190 in February, 1924, to 375 shortly after the close of the fiscal year.

The difficulties of administering this hospital in an overcrowded condition are increased by the fact that it is an old institution, entirely of frame construction, the buildings having been erected for temporary use only. While the location is satisfactory for hospital purposes, new buildings, especially fireproof wards for bed-fast patients, are urgently needed to replace dilapidated structures and enlarge the institution. In spite of difficulties, however, and the tremendous demands made upon the hospital, the professional work has been of the very highest quality. In this hospital, in conformity with a practice common to most marine hospitals, Wassermann tests, urinalyses, dental examinations, and microscopical search for intestinal parasites are made routine for all patients admitted to the medical wards.

*Marine Hospital No. 19, San Francisco, Calif.*—The marine hospital at San Francisco was filled to capacity and frequently over-filled during the year. The number of beds was increased from 286 to 320 by removing 22 attendants from a building which is now devoted to surgical patients. The quartering of these attendants outside the hospital reservation has added to the expense of operation.

As a measure of its activities, it may be mentioned that during the year there were 2,840 surgical operations, not including dental operations, and 3,126 intravenous injections of arsphenamine and neoarsphenamine. There were 4,689 patients treated in the physiotherapy department alone, 55,166 such treatments being given. In addition to the hospital activities proper, 6,385 out-patients were treated. This hospital has completely outgrown its present equipment. Upon investigation, it has been found impracticable to secure more than a small number of beds in contract hospitals in the city for service patients. Bills have several times been introduced, and one such bill (S. 1550) is now pending in the Congress for the construction of new buildings on the present marine-hospital site.

*Marine Hospital No. 21, Stapleton, N. Y.*—Marine Hospital No 21 has outgrown the buildings in which it is housed. Two of these were occupied in 1832 and 1837, respectively, the institution at that time being known as the Seamen's Retreat. The buildings and 10 acres of ground were leased by the Federal Government when the marine hospital on Bedloes Island was abandoned in 1883 to permit of the erection of the Statue of Liberty at that place, and were finally purchased in 1903 for the sum of \$250,000. A bill (H. R. 8520) is now pending before the Congress providing for additional buildings and land to enlarge this institution and reduce fire hazards, especially those incident to the use of frame structures which were erected shortly after the World War as a temporary expedient.

Average per diem cost of in-patient relief, U. S. marine hospitals, fiscal year 1924

GROUP OF HOSPITALS	NO	HOSPITAL LOCATION	RELIEF DAYS	COST PER PATIENT DAY			STATION RATION PRODUCTION					
				TOTAL	SALARIES	FOOD	OTHER	OTHER	FOOD	OTHER	OTHER	OTHER
GENERAL	1	Baltimore, Md.	50,256	3.99	2.29	.71	.99					
	2	Boston, Mass.	49,650	3.52	1.84	.67	1.01					
	3	Buffalo, New York	23,188	4.18	2.40	.52	1.26					
	4	Chicago, Illinois	44,693	4.29	2.24	.74	1.31					
	5	Cleveland, Ohio	28,203	3.73	2.28	.59	1.05					
	6	Detroit, Mich.	25,854	4.36	2.24	.67	1.35					
	7	Evansville, Ind.	13,879	3.81	2.25	.62	.94					
	8	Key West, Florida	6,472	6.63	3.31	.72	2.60					
	9	Louisville, Ky.	18,626	3.70	2.29	.61	.80					
	10	Memphis, Tenn.	9,933	4.72	2.69	.65	1.38					
	11	Mobile, Alabama	25,352	3.67	1.85	.66	1.16					
	12	New Orleans, La.	73,410	3.47	1.91	.64	.92					
	13	Pittsburgh, Pa.	16,579	4.45	2.66	.71	1.08					
	14	Portland, Maine	20,386	4.62	2.81	.62	1.19					
	15	Port Townsend, Wn.	33,412	2.12	1.75	.52	.75					
	16	St. Louis, Mo.	20,505	4.82	2.45	.64	1.73					
	17	San Francisco, Cal.	104,517	3.03	1.71	.72	.40					
	18	Savannah, Georgia	27,672	3.55	1.96	.63	.95					
	19	Stapleton, New York	101,369	3.86	2.00	.57	1.19					
	20	Wineyard Haven, Mass.	7,316	3.77	2.15	.69	.93					
	21	Ellis Island, New York	124,559	3.93	1.97	.69	1.27					
	22	Hudson St., New York	7,487	4.02	1.75	.65	1.59					
	23	Norfolk, Virginia	56,637	4.34	2.45	.72	1.17					
	Per Diem Cost for General Hospitals			3.82	2.07	.67	1.08					
TUBERCULOSIS	Total Relief Days			880,570	Cost \$3,366,740.75							
	9	Ft. Stanton, N. Mex.	77,791	3.64	1.44	.79	1.41					
LEPROSARIUM	Cost \$203,355.31											
	66	Carrillo, Louisiana	64,713	4.24	2.19	.65	1.40					
	Cost \$274,638.17											
	Per Diem Cost for all Hospitals			3.84	2.03	.63	1.13					
	Relief Days for all Hospitals			1,022,804	Total Cost \$3,934,624.23							

NOTE.—This study is based on items of operating expenses of U. S. marine hospitals, after deducting miscellaneous income, received from the sales of rations and meals, grease and garbage, sales of occupational therapy articles, and sales of unserviceable property, which money is deposited as miscellaneous receipts, Treasury Department. Per diem cost for salary does not include commutation for quarters, subsistence, and laundry. Food covers cost of patients only. Other includes all other expenses of operation, such as supplies, food for personnel, telephone, telegraph, burials, freight and express, water, gas, electricity, etc. Figures are not final and subject to revision.

FIG. 2

A total of 2,966 patients were admitted during the year, which represents an increase of 32.3 per cent over the admissions of the previous year. It supplied a total of 101,369 days' relief, an increase of 10.5 per cent. A measure of its activities is seen in its 22,928 physiotherapy treatments, 5,749 X ray exposures, and 3,056 intravenous injections of arsphenamine.

*Marine Hospital No. 70, New York City.*—This station, while classed as a hospital, is in reality a large out-patient office with 23 emergency beds. Its patients are evacuated as soon as practicable to the large marine hospitals at Stapleton and Ellis Island. It operates three ambulances, conducts a 24-hour a day service, and its branch dispensaries, five in number, supply important parts of Greater New York.

The number of treatments at this institution now averages over 2,000 per week. The greatest number of physical examinations in any one week was 568. The importance of the skin and syphilis department is shown by the fact that during the year there were 2,948 new patients, 18,225 treatments, including 5,238 salvarsan injections, and 2,832 mercury injections. In a total of 10,126 salvarsan injections administered since the opening of this department there has been no serious reaction. The genito-urinary department has 2,798 new patients, with a total of 13,481 treatments, which is an increase of 4,000 over last year. In the dental department 836 bridges, full or partial dentures, and other prosthetic appliances were furnished; sittings numbered 8,806, extractions 3,329, and fillings 4,163.

*Marine Hospital No. 43, Ellis Island, N. Y.*—The marine hospital at Ellis Island continued to receive a portion of the overflow of patients from Marine Hospitals Nos. 21 and 70 in New York City, but the bulk of its patients are detained immigrants who require hospital care. During the year it admitted 10,644 patients, of whom 10,285 were immigrants (5,461 men, 2,685 women, and 2,139 children). There were 105 deaths and 26 births, and a total of 124,559 hospital days.

Patients born in 75 different countries were received in the hospital. Owing to the variety of languages spoken and the social problems presented, special employees are required to obtain histories, translate and interpret, conduct visitors, and secure information for patients. These workers make daily rounds in wards and interview patients in their native languages. Troubles are heard, questions answered, and an effort is made to adjust social problems. Writing paper and envelopes are provided without expense to the Government, and toys for the children and other articles donated from outside sources are distributed. The reception of hospital visitors is in itself a problem of some magnitude, since 350 have called in a single day and the average daily number is 125. Ambulatory patients are escorted to the recreation room to see their relatives and friends, thus relieving the hospital wards of congestion and confusion. Each Sunday during the year two religious services were held in the hospital service room for Catholics and Protestants, respectively, and weekly visits are made by representatives of the Jewish faith.

Reimbursements paid by the Public Health Service to the Bureau of Immigration for light, heat, power, and telephone service amounted

during the year to approximately \$100,000. Money collected from the steamship companies for the care of immigrants is deposited to the general credit of the United States and is not available for expenditure by the Public Health Service.

#### THE NURSING, DIETETIC, AND RECONSTRUCTION SECTION

The nursing section, in charge of Superintendent of Nurses Lucy Minnigerode, includes in its activities the general supervision of dietitians, reconstruction aides, librarians, and social-service workers. The report of this section is included in that of the hospital division for purposes of convenience and because the work is chiefly related to the hospitals. There are more than 400 trained women engaged in these professional activities, of whom 360 are nurses, 22 dietitians, and 37 physiotherapy aides. Five social-service workers are employed at Ellis Island among immigrants in hospital, where unusual and difficult social problems arise.

In addition to the supervisory functions over the field personnel above referred to the superintendent of nurses has charge of the emergency rest room in the Surgeon General's office. She also represented the service on special committees of the Federal Specification Board of the Bureau of Standards and has prepared various papers on nursing and related subjects during the year. An exhibit designed to show the scope of the work of the Public Health Service was also prepared and shown at the meeting of the American Nurses' Association held in Detroit June 16 to 21, 1924.

It is unfortunate that, against the protest of the Surgeon General, nurses have been placed by the Personnel Classification Board in the subprofessional or nonprofessional class instead of in the professional class. Unfavorable results of this action have already become apparent in the efforts made by the superintendents of nurses in some of the high-grade training schools to prevent their graduates from entering the Government service because of the lack of definite status and proper recognition of nurses therein. Legislation looking toward the improvement of the nurses' status in line with that already adopted by the Army and Navy is desirable, since it is believed only logical that these three permanent services should have the same laws and as nearly as possible the same regulations for the nurses in the services as they have in regard to the officers of the services.

TABLE 1.—*Number of patients treated annually, 1868 to 1924*<sup>1</sup>

Fiscal year	Sick and disabled patients furnished relief	Fiscal year	Sick and disabled patients furnished relief
Prior to reorganization:		After reorganization—Continued.	
1868.....	11, 535	1896.....	53, 804
1869.....	11, 356	1897.....	54, 477
1870.....	10, 560	1898.....	52, 709
After reorganization:		1899.....	55, 489
1871.....	14, 256	1900.....	56, 355
1872.....	13, 156	1901.....	58, 381
1873.....	13, 529	1902.....	56, 310
1874.....	14, 356	1903.....	58, 573
1875.....	15, 009	1904.....	58, 556
1876.....	16, 808	1905.....	57, 013
1877.....	15, 175	1906.....	54, 363
1878.....	18, 223	1907.....	55, 129
1879.....	20, 922	1908.....	54, 301
1880.....	24, 860	1909.....	53, 704
1881.....	32, 613	1910.....	51, 443
1882.....	36, 184	1911.....	52, 209
1883.....	40, 195	1912.....	51, 078
1884.....	44, 761	1913.....	50, 604
1885.....	41, 714	1914.....	53, 226
1886.....	43, 822	1915.....	55, 782
1887.....	45, 314	1916.....	58, 357
1888.....	48, 203	1917.....	64, 022
1889.....	49, 518	1918.....	71, 614
1890.....	50, 671	1919.....	79, 863
1891.....	52, 992	1920.....	110, 907
1892.....	53, 610	1921.....	144, 344
1893.....	53, 317	1922.....	153, 633
1894.....	52, 803	1923.....	126, 956
1895.....	52, 643	1924.....	159, 686

<sup>1</sup> These figures do not include patients treated in connection with veterans' relief activities of the service, as follows: 1918, 192; 1919, 13,856; 1920, 279,036; 1921, 667,832; 1922, 242,379; 1923, 9,704; and 1924, 3,414.



TABLE 2.—Transactions at United States marine hospitals and other relief stations, fiscal year 1924

Location	Total number of patients treated	Total number treated in hospital	Died	Remaining in hospital June 30, 1924	Number of days' relief in hospital	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
<b>FIRST-CLASS STATIONS</b>								
Grand total	163, 100	40, 981	882	3, 282	1, 232, 754	122, 119	403, 864	62, 709
<b>MARINE HOSPITALS</b>								
1. Baltimore, Md.	4, 291	1, 155	34	138	50, 256	3, 136	10, 459	1, 607
2. Boston, Mass.	3, 819	1, 311	23	121	49, 690	2, 508	7, 639	2, 262
3. Buffalo, N. Y.	2, 595	570	11	69	23, 188	2, 025	8, 198	1, 290
Contract overflow hospital	36	36	2	2	760			
5. Chicago, Ill.	25, 245	1, 027	27	115	44, 693	24, 218	54, 764	1, 081
6. Cleveland, Ohio.	3, 051	1, 108	12	74	28, 203	1, 943	5, 262	2, 020
Contract overflow hospital	1	1			23			
7. Detroit, Mich.	3, 589	720	26	58	25, 854	2, 869	6, 712	1, 556
Contract overflow hospital	17	17		2	1, 037			
8. Evansville, Ind.	661	559	5	43	13, 879	102	331	290
9. Fort Stanton, N. Mex.	1, 200	361	31	214	77, 791	839	2, 095	110
10. Key West, Fla.	682	237	6	41	6, 472	445	821	55
11. Louisville, Ky.	1, 063	887	4	41	18, 626	176	966	318
Contract overflow hospital	2	2			3			
12. Memphis, Tenn.	727	403	7	29	9, 933	324	851	186
13. Mobile, Ala.	2, 315	832	18	47	25, 952	1, 483	6, 879	2, 496
14. New Orleans, La.	5, 007	2, 028	58	303	73, 410	2, 979	11, 433	8, 455
Contract overflow hospital	1	1			45			
15. Pittsburgh, Pa.	879	430	23	41	16, 679	449	2, 847	302
Contract overflow hospital	6	6		1	223			
16. Portland, Me.	917	405	9	18	10, 366	512	600	558
17. Port Townsend, Wash.	1, 079	830	23	92	33, 412	249	439	20
Contract overflow hospital	34	34	2	5	4, 710			
18. St. Louis, Mo.	1, 420	467	23	60	20, 506	953	4, 099	910
Contract overflow hospital	6	6			83			
19. San Francisco, Calif.	8, 750	2, 365	66	294	104, 517	6, 385	18, 051	2, 608
Contract overflow hospital	39	39	4	32	10, 437			
20. Savannah, Ga.	2, 031	680	13	68	27, 076	1, 342	3, 384	651
21. Stapleton, N. Y.	4, 231	3, 185	95	264	101, 369	1, 046	2, 741	454
Contract overflow hospital	17	17	1		320			
22. Vineyard Haven, Mass.	265	142	9	16	7, 316	123	287	10
43. Ellis Island, N. Y.	11, 009	10, 825	105	259	124, 559	184	254	88
66. Carville, La.	233	216	12	200	64, 713	17	88	1
70. New York City, N. Y.	19, 134	603	12	17	7, 487	18, 531	95, 402	10, 438
82. Norfolk, Va.	4, 933	1, 768	28	158	56, 837	3, 165	7, 058	1, 970
Contract overflow hospital	1	1			19			
Total	109, 286	33, 283	689	2, 804	1, 040, 464	76, 003	251, 810	39, 648

TABLE 2.—Transactions at United States marine hospitals and other relief stations, fiscal year 1924—Continued

Location	Total number of patients treated	Total number treated in hospital	Died	Remaining in hospital June 30, 1924	Number of days' relief in hospital	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
SECOND, THIRD, AND FOURTH CLASS STATIONS, ETC.								
255. Aberdeen, Wash.	259	41	1	—	498	218	319	5
260. Albany, N. Y.	59	17	1	—	437	42	192	143
201. Apalachicola, Fla.	126	21	—	1	293	105	265	—
202. Ashland, Wis.	95	22	—	—	274	73	179	20
203. Ashtabula, Ohio.	236	43	3	—	704	213	398	15
204. Astoria, Oreg.	230	42	—	2	845	188	423	64
301. Balboa Heights, Canal Zone.	1,024	600	7	27	12,079	424	502	2
207. Bangor, Me.	24	5	—	—	49	19	21	98
348. Bath, Me.	—	—	—	—	—	—	—	—
208. Bay City, Mich.	48	5	1	1	52	43	108	9
209. Beaufort, N. C.	184	21	1	—	295	163	917	31
349. Beaufort, S. C.	—	—	—	—	—	—	—	—
210. Bellingham, Wash.	119	8	1	—	59	111	286	11
213. Boothbay Harbor, Me.	61	19	1	2	233	42	144	7
215. Bridgeport, Conn.	7	7	—	—	83	—	—	—
103. Brunswick, Ga.	103	16	1	1	118	87	136	15
217. Burlington, Iowa.	28	19	—	1	295	9	10	—
219. Burlington, Iowa.	314	45	1	4	651	269	681	20
220. Cairo, Ill.	1	1	—	—	36	—	—	—
227. Calais, Me.	30	19	1	2	199	11	11	2
221. Cambridge, Md.	353	74	—	3	642	353	1,060	18
244. Cape May, N. J.	579	74	—	—	—	505	1,266	191
224. Charleston, S. C.	—	—	—	—	—	—	—	—
350. Chattanooga, Tenn.	—	—	—	—	—	—	—	—
228. Cincinnati, Ohio	239	56	2	2	870	183	394	213
229. Cordova, Alaska	100	21	—	—	539	76	94	—
230. Crisfield, Md.	286	20	—	1	253	266	649	7
234. Duluth, Minn.	482	58	1	1	711	424	622	308
236. Eastport, Me.	10	—	—	—	10	10	16	4
237. Edenton, N. C.	18	—	—	—	—	18	18	4
238. Elizabeth City, N. C.	105	7	2	—	86	98	238	60
351. Ellsworth, Me.	—	—	—	—	—	—	—	—
352. El Paso, Tex.	217	14	1	3	357	203	1,052	116
239. Erie, Pa.	400	103	4	1	896	357	1,160	14
240. Escanaba, Mich.	38	13	—	—	25	25	29	7
241. Eureka, Calif.	225	59	2	—	1,237	166	299	49
242. Galapoli, Ohio.	116	20	—	2	529	90	209	20
243. Galveston, Tex.	4,069	665	18	32	14,143	3,404	13,212	1,465
245. Georgetown, S. C.	69	7	1	—	50	62	111	8
246. Gloucester, Mass.	175	6	—	—	65	169	542	28
247. Gloucester, Mich.	78	11	—	1	153	67	155	135
248. Grand Haven, Mich.	84	16	—	1	137	68	146	38
249. Green Bay, Wis.	—	—	—	—	—	—	—	—

	42	9	1	91	33	38	4
250. Gulfport, Miss.	61	7	2	149	54	108	08
251. Hancock, Mich.	8	8		54			
252. Hartford, Conn.	756	256	10	5,647	500	1,139	159
254. Honolulu, Hawaii	807	60		1,171	204	480	54
258. Jacksonville, Fla.	204	184	4	2,280	623	894	296
260. Juneau, Alaska.	113	39	1	899	74	79	21
262. Ketchikan, Alaska.	303	89		1,051	214	364	4
264. La Crosse, Wis.	48	3		22	45	83	28
242. Lee Hall, Va.	233				233	394	
265. Lewes, Del.	256	10		265	237	651	20
246. Little Rock, Ark.	57	8		186	49	132	110
266. Los Angeles, Calif.	990	657	12	9,326	333	805	936
268. Ludington, Mich.	78	14	1	194	61	284	12
269. Maclias, Me.	36				36	95	51
270. Manila, P. I.	988	215		5,056	743	1,146	497
271. Manistee, Mich.	75	11	1	244	64	13	13
272. Manitowoc, Wis.	129	45	1	827	84	146	10
273. Marquette, Mich.	208	18	3	289	190	672	31
274. Marshfield, Oreg.	75	12	1	513	63	165	72
277. Menominee, Mich.	87	2		9	85	215	64
347. Miami, Fla.	43	10		279	33	127	19
278. Milwaukee, Wis.	1,029	212	6	3,292	817	1,915	715
282. Nantucket, Mass.	25				25	60	6
283. Nashville, Tenn.	62	2		42	60	119	39
284. Natchez, Miss.	113	9		50	104	235	21
285. New Bedford, Mass.	329	8		193	321	526	265
286. New Bern, N. C.	214	112	1	1,028	102	223	85
288. New Haven, Conn.	24	9	3	91	15	26	78
289. New London, Conn.	263	90	2	1,365	173	201	118
291. Newport, Ark.	31	1		13	30	35	
292. Newport, Oreg.	75	3		78	72	190	2
293. Newport, R. I.	197	34	1	327	163	219	19
223. Newport News, Va.	81				81	217	4
295. Nome, Alaska.	30			31	34	143	11
297. Ogdenburg, N. Y.	62	5		46	55	125	24
298. Oswego, N. Y.	74	18		306	56	173	43
300. Paducah, Ky.	238	38	2	377	200	1,050	21
302. Pensacola, Fla.	460	102	2	1,308	358	922	92
303. Perth Amboy, N. J.	76	18	1	608	58	116	16
334. Petersburg, Alaska.	64				64	278	
305. Philadelphia, Pa.	3,082	673	9	9,344	2,409	10,434	2,698
307. Ponce, P. R.	37	10	1	115	27	60	5
308. Port Angeles, Wash.	153	10		94	143	200	73
309. Port Arthur, Tex.	885	201	2	3,264	684	2,440	192
210. Port Huron, Mich.	248	21		318	227	722	132
312. Portland, Oreg.	1,278	216	7	5,010	1,062	2,891	796
356. Portsmouth, N. H.	3				3	4	
314. Providence, R. I.	270	93	2	1,665	177	280	348
315. Provincetown, Mass.	66				66	140	24
353. Reedville, Va.							
316. Richmond, Va.	73	10		55	63	127	29
317. Rock Island, Ill.	2,125	8	1	50	2,117	8,019	501

TABLE 2.—Transactions at United States marine hospitals and other relief stations, fiscal year 1924.—Continued

Location	Total number of patients treated	Total number treated in hospital	Died	Remaining in hospital June 30, 1924	Number of days' relief in hospital	Number of patients furnished office relief	Number of times office relief was furnished	Number of physical examinations
SECOND, THIRD, AND FOURTH CLASS STATIONS, ETC.—Continued								
318. Rockland, Me.	198	7	2	—	83	191	335	39
320. Saginaw, Mich.	37	1	—	—	18	36	80	18
319. St. Thomas, Virgin Islands.	101	30	—	—	124	71	145	43
354. Salem, Mass.	505	156	11	42	12,006	349	903	243
323. San Diego, Calif.	66	5	—	—	75	61	107	5
324. Sandusky, Ohio.	1,032	547	10	65	22,569	485	728	894
326. San Juan, P. R.	3,249	—	—	—	—	3,249	5,030	545
335. San Pedro, Calif.	360	186	3	6	1,754	174	479	82
327. Saint Ste. Marie, Mich.	2,584	105	9	14	6,091	2,419	5,074	1,752
329. Seattle, Wash.	33	3	—	—	6,091	50	139	26
331. Sheboygan, Wis.	190	24	1	—	267	166	294	3
328. Sitka, Alaska	108	9	—	—	88	99	161	—
332. Solomons, Md.	110	22	—	1	456	88	227	42
334. South Bend, Wash.	157	—	—	—	—	157	384	33
361. Southport, N. C.	210	46	4	2	1,032	164	278	8
335. Superior, Wis.	425	45	1	2	773	280	1,238	251
345. Tacoma, Wash.	481	92	3	2	1,835	359	598	132
336. Tampa, Fla.	538	100	3	—	1,239	438	963	236
337. Toledo, Ohio.	18	7	—	—	208	11	60	—
357. Unalaska, Alaska.	362	99	—	2	1,300	263	961	88
338. Vicksburg, Miss.	2,054	190	1	6	2,901	1,864	26,136	4,212
339. Washington, D. C.	734	—	—	—	—	734	4,640	—
360. Washington, D. C.	63	6	—	—	58	57	132	5
340. Washington, N. C.	303	70	2	—	970	233	504	133
342. Wilmington, N. C.	33	4	—	—	24	29	159	2
343. Wrangell, Alaska.	—	—	—	—	—	—	—	—
MISCELLANEOUS								
Black Mountain, N. C., Cragmont Sanatorium.	7	7	2	5	1,954	—	—	—
Curtis Bay, Md., U. S. Coast Guard Depot.	2,463	—	—	—	—	2,463	6,187	263
New London, Conn., U. S. Coast Guard Academy	2,134	—	—	—	—	2,134	5,324	287
New Orleans, La., quarantine station.	16	16	2	—	1,638	—	—	—
Washington, D. C., St. Elizabeths Hospital.	144	144	12	108	39,002	—	—	—
Wilmington, Del.	75	—	—	—	—	75	296	20
U. S. Coast Guard contract physicians.	2,001	1	—	—	16	2,000	6,565	688
U. S. Coast Guard vessels.	4,999	—	—	—	—	4,999	17,107	1,031
Total.	53,814	7,698	193	478	192,290	46,116	152,054	23,061
Grand total.	163,100	40,981	882	3,282	1,232,754	122,119	403,864	62,709

TABLE 3.—Relief furnished at United States marine hospitals and other relief stations, fiscal year 1924, classified by beneficiary

## PUBLIC HEALTH SERVICE

225

Beneficiary	Class of station	Total number of patients treated	Total number treated in hospital	Died	Remain- ing in hospital June 30, 1924	Number of days' re- lief in hospital	Number of patients furnished office re- lief	Number of times office relief was furnished	Number of physical examina- tions
American seamen.....	First-class stations.....	55, 144	15, 433	455	1, 913	675, 767	39, 711	151, 143	19, 159
	Other relief stations.....	29, 249	5, 819	157	373	147, 592	23, 430	56, 889	4, 664
	Total.....	84, 393	21, 252	612	2, 286	823, 359	63, 141	208, 032	23, 823
Foreign seamen.....	First-class stations.....	454	380	18	27	10, 413	74	208	1, 212
	Other relief stations.....	243	163	5	4	1, 555	140	289	2
	Total.....	697	483	23	31	12, 268	214	497	1, 214
U. S. Coast Guard.....	First-class stations.....	3, 522	1, 262	8	74	30, 818	2, 260	6, 214	2, 850
	Other relief stations.....	6, 472	370	7	14	5, 670	6, 102	15, 971	2, 439
	Coast Guard vessels.....	4, 999	-----	-----	-----	-----	4, 999	17, 107	1, 031
	Contract physicians.....	2, 001	1	-----	-----	16	2, 000	6, 565	688
	Total.....	16, 994	1, 633	15	88	36, 504	15, 361	45, 857	7, 008
U. S. Army.....	First-class stations.....	484	39	-----	2	605	445	886	210
	Other relief stations.....	49	6	-----	-----	45	43	102	230
	Total.....	533	45	-----	2	650	488	988	440
U. S. Navy.....	First-class stations.....	87	45	-----	3	798	42	431	83
	Other relief stations.....	74	18	-----	-----	189	56	131	6
	Total.....	161	63	-----	3	987	98	562	89
Mississippi River Commission.....	First-class stations.....	230	153	2	5	3, 608	77	177	15
	Other relief stations.....	186	33	2	-----	232	153	305	2
	Total.....	416	186	4	5	3, 840	230	682	17
Seamen, U. S. Engineer Corps and Army Trans- port Service.....	First-class stations.....	856	391	17	42	13, 641	465	1, 396	38
	Other relief stations.....	853	153	3	8	2, 215	700	2, 151	52
	Total.....	1, 709	544	20	50	15, 856	1, 165	3, 547	90

TABLE 3.—*Relief furnished at United States marine hospitals and other relief stations, fiscal year 1924, classified by beneficiary—Continued*

Beneficiary	Class of station	Total number of patients treated	Total number treated in hospital	Died	Remain- ing in hospital June 30, 1924	Number of days' re- lief in hospital	Number of patients furnished office re- lief	Number of times office relief was furnished	Number of physical examina- tions
U. S. Lighthouse Service.....	First-class stations.....	710	267	13	24	8, 218	443	1, 369	112
	Other relief stations.....	665	86	3	5	1, 681	579	1, 530	127
	Total.....	1, 375	353	16	29	9, 899	1, 022	2, 899	239
U. S. Coast and Geodetic Survey.....	First-class stations.....	58	36	---	1	1, 134	22	35	92
	Other relief stations.....	470	96	---	---	1, 049	374	1, 079	549
	Total.....	528	132	---	1	2, 183	396	1, 114	641
U. S. Employees' Compensation Commission.....	First-class stations.....	30, 435	1, 155	10	133	35, 600	29, 280	77, 326	545
	Other relief stations.....	6, 830	442	3	19	7, 823	6, 388	44, 578	326
	Total.....	37, 265	1, 597	13	152	43, 423	35, 668	121, 904	871
U. S. Veterans' Bureau.....	First-class stations.....	2, 856	2, 686	50	161	67, 524	170	2, 305	218
	Other relief stations.....	541	397	6	49	18, 456	144	283	798
	Total.....	3, 397	3, 083	56	210	85, 980	314	2, 588	1, 016
Discharged allied soldiers.....	First-class stations.....	17	14	---	3	1, 023	3	15	---
	Other relief stations.....	---	---	---	---	---	---	---	---
	Total.....	17	14	---	3	1, 023	3	15	---
U. S. Immigration Service.....	First-class stations.....	10, 844	10, 699	94	195	117, 524	145	151	184
	Other relief stations.....	316	142	3	6	3, 652	174	802	222
	Total.....	11, 160	10, 841	97	201	121, 176	319	956	406
U. S. Public Health Service officers and em- ployees.....	First-class stations.....	3, 036	442	7	17	7, 745	2, 594	9, 533	672
	Other relief stations.....	628	16	2	---	157	612	3, 442	33
	Total.....	3, 664	458	9	17	7, 902	3, 206	12, 955	705
Lepers.....	First-class stations.....	245	245	12	200	64, 795	---	---	---
	Other relief stations.....	16	16	2	---	1, 658	---	---	---
	Total.....	261	261	14	200	66, 453	---	---	---

[illegible]

TABLE 4.—*Causes of admission for discharged patients and condition on discharge, United States marine hospitals and other relief stations, fiscal year 1924*

Disease or condition	Number having specified disease or injury <sup>1</sup>					Condition on discharge of patients admitted for specified disease or injury				
	Major condition for which admitted <sup>2</sup>	Condition second in importance	Condition third in importance <sup>3</sup>	Sequelæ to major condition	Total number of persons having each specified disease or injury	Cured	Improved	Not improved	Died	Other conditions
Abnormalities and congenital malformations.....	17	---	---	---	---	4	7	1	---	5
Blood and blood-forming organs, diseases and injuries of.....	37	---	---	---	---	5	17	---	5	10
Bones and cartilages, diseases and injuries of.....	1,469	---	---	---	---	337	619	2	29	482
Circulatory system, diseases and injuries of:										
Heart disease, valvular.....	282	209	56	21	568	3	131	2	42	104
Varicose veins.....	124	70	23	4	223	44	60	---	1	19
All others.....	543	---	---	---	---	86	282	4	60	141
Communicable and infectious diseases, not including tuberculosis and venereal:										
Conjunctivitis, granular trachomatous.....	79	4	20	13	116	23	42	---	---	14
Dengue.....	20	1	7	---	28	9	10	---	---	1
Influenza.....	322	16	21	---	359	194	96	---	2	30
Leprosy.....	61	5	---	---	66	---	---	14	47	64
Malaria.....	426	8	19	10	463	137	219	1	5	64
Rheumatic fever, acute.....	113	12	14	8	147	31	66	1	2	13
Typhoid fever.....	141	6	8	---	155	81	26	---	24	10
All others.....	377	---	---	---	---	250	83	1	7	36
Dental.....	140	---	---	---	---	33	69	---	---	38
Digestive system, diseases and injuries of:										
Appendicitis.....	512	65	23	4	604	282	155	---	16	59
Gastritis.....	291	34	40	---	365	100	170	---	2	29
Hemorrhoids.....	280	126	54	13	473	126	111	---	---	43
All others.....	902	---	---	---	---	293	423	2	18	166
Ear, nose and throat, diseases and injuries of:										
Deviation, nasal septum.....	162	57	23	2	244	65	48	---	---	49
Otitis media.....	129	86	41	10	266	21	80	---	2	26
Tonsillitis.....	1,326	413	208	13	1,960	664	406	---	2	254
All others.....	439	---	---	---	---	151	212	---	3	73
Endocrine, diseases and injuries of:										
Eye and annexa, diseases and injuries of.....	134	---	---	---	---	9	67	1	13	44
Genitourinary system, diseases and injuries of (exclusive of venereal):	231	---	---	---	---	41	96	2	---	89
Nephritis.....	161	98	70	18	347	8	61	1	34	57
All others.....	698	169	23	29	1,224	199	339	3	14	143
Hernia.....	1,003	---	---	---	---	635	191	---	15	162



Joints and bursae, diseases and injuries of:									
Arthritis.....	495	149	28	21	693	87	384	4	6
All others.....	379					74	186	1	2
Lymphatic system, diseases and injuries of:									
Lymphadenitis.....	306	40	10	4	360	73	175		1
Lymphadenitis.....	21					7	7		1
All others.....									
Muscles, fasciae, tendons, and tendon sheaths, diseases and injuries of.....	827					260	438		4
Nervous system, diseases and injuries of:									
Epilepsy without psychosis.....	84	8	3	4	99	2	24	1	1
Neuritis.....	194	32	28	2	256	39	97	5	3
All others.....	389					43	181	3	29
Obstetric and gynecological conditions.....	11					4	6		
Parasitic diseases:									
Unclonafasis.....	45	62	24		131	12	17		1
All others.....	116					22	42	1	5
Poisonings and intoxications:									
Alcohol (ethyl) poisoning, acute.....	150	23	1		174	50	70		3
Alcoholism, chronic (without psychosis).....	43	12			55	7	25		2
All others.....	75					33	23		7
Psychiatric diseases:									
Drug addiction without psychosis.....	24	11	7		42		15		9
All others.....	262					21	53	3	7
Respiratory system, diseases and injuries of (exclusive of tuberculosis):									
Asthma.....	173	33	21	11	238	6	95		5
Bronchitis.....	686	208	49	23	976	255	296	1	6
Pleurisy.....	193	88	35	13	329	53	104		7
Pneumonia.....	300	46	42	41	429	130	61		78
All others.....	12					1	4		6
Skin and its appendages, diseases and injuries of.....	612					202	293	1	9
Tuberculosis:									
Tuberculosis, pulmonary.....	1,365	207	33		1,605		162	6	174
Other forms.....	102	62	15	23	202	6	46	1	19
Tumors:									
Carcinoma.....	122	16	8	18	164	8	20	1	40
All others.....	177					66	59	1	9
Venereal diseases:									
Chancroidal infections.....	776	124	18	340	1,258	236	410		
Gonococcal infections.....	2,477	291	30	1,303	4,101	412	1,535	1	6
Syphilis.....	1,705	866	203		2,774	64	1,121	4	20
All others.....	26					7	12		7
Inoculations.....	26					3	3		
Under observation:									
Miscellaneous.....	509								1
Cellulitis:									
All others.....	212	23	9	29	273	88	85		1
Total.....	4,678					1,298	1,760	8	56
Total.....	27,401					7,403	11,805	64	814
Total.....									7,315

<sup>1</sup> Except in the case of specific diseases, statistics are given only for the major condition for which admitted. <sup>2</sup> Where sequelae were given, no third diagnosis was recorded.

<sup>3</sup> Represents number of discharges for each condition.

NOTE.—This table does not include immigration patients discharged from U. S. Marine Hospital No. 43, Ellis Island, N. Y.

TABLE 5.—*Causes of death in United States marine hospitals and other relief stations during fiscal year 1924*

Inter- national list No.	Cause of death	Number of deaths
I. EPIDEMIC, ENDEMIC, AND INFECTIOUS DISEASES		
1	Typhoid and paratyphoid fever.....	25
5	Malaria.....	3
16	Dysentery.....	5
20	Leprosy.....	6
21	Erysipelas.....	2
31	Tuberculosis of the respiratory system.....	189
32	Tuberculosis of the meninges and central nervous system.....	7
33	Tuberculosis of the intestines and peritoneum.....	9
34	Tuberculosis of the vertebral column.....	1
36	Tuberculosis of other organs.....	5
37	Disseminated tuberculosis.....	6
38	Syphilis.....	16
40	Gonococcus infection.....	1
41	Purulent infection, septicemia.....	4
II. GENERAL DISEASES NOT INCLUDED ABOVE		
43	Cancer and other malignant tumors of the buccal cavity.....	7
44	Cancer and other malignant tumors of the stomach and liver.....	22
45	Cancer and other malignant tumors of the peritoneum, intestines, and rectum.....	3
49	Cancer and other malignant tumors of other or unspecified organs.....	28
50	Benign tumors and tumors not returned as malignant.....	3
51	Acute rheumatic fever.....	1
57	Diabetes mellitus.....	12
58	Anemia, chlorosis.....	4
60	Diseases of the thyroid gland.....	1
65	Leukemia and Hodgkin's disease.....	3
66	Alcoholism, acute and chronic.....	4
III. DISEASES OF THE NERVOUS SYSTEM AND OF THE ORGANS OF SPECIAL SENSE		
70	Encephalitis.....	6
71	Meningitis.....	4
72	Tabes dorsalis (locomotor ataxia).....	2
74	Cerebral hemorrhage, apoplexy.....	21
75	Paralysis without specified cause.....	3
76	General paralysis of the insane.....	8
77	Other forms of mental alienation.....	2
78	Epilepsy.....	1
84	Other diseases of the nervous system.....	1
86	Diseases of the ear and of the mastoid process.....	2
IV. DISEASES OF THE CIRCULATORY SYSTEM		
87	Pericarditis.....	1
88	Endocarditis and myocarditis.....	5
89	Angina pectoris.....	3
90	Other diseases of the heart.....	83
91	Diseases of the arteries.....	11
92	Embolism and thrombosis (not cerebral).....	4
95	Hemorrhage without specified cause.....	1
V. DISEASES OF THE RESPIRATORY SYSTEM		
99	Bronchitis.....	2
100	Bronchopneumonia.....	28
101	Pneumonia.....	79
102	Pleurisy.....	5
105	Asthma.....	3
107	Other diseases of the respiratory system (tuberculosis excepted).....	4
VI. DISEASES OF THE DIGESTIVE SYSTEM		
111	Ulcer of the stomach and duodenum.....	9
117	Appendicitis and typhlitis.....	9
118	Hernia, intestinal obstruction.....	12
119	Other diseases of the intestines.....	3
122	Cirrhosis of the liver.....	5
123	Biliary calculi.....	1
124	Other diseases of the liver.....	4
126	Peritonitis without specified cause.....	8
127	Other diseases of the digestive system (cancer and tuberculosis excepted).....	2

TABLE 5.—*Causes of death in United States marine hospitals and other relief stations during fiscal year 1924—Continued*

Inter- national list No.	Cause of death	Number of deaths
VII. NONVENEREAL DISEASES OF THE GENITOURINARY SYSTEM AND ANNEXA		
128	Nephritis, acute.....	11
129	Nephritis, chronic.....	30
131	Other diseases of the kidneys and annexa.....	6
132	Calculi of the urinary passages.....	1
133	Diseases of the bladder.....	3
134	Diseases of the urethra, urinary abscess, etc.....	4
135	Diseases of the prostate.....	3
XIV. EXTERNAL CAUSES		
166	Suicide by corrosive substances.....	2
171	Suicide by cutting or piercing instruments.....	1
174	Other suicides.....	1
177	Other acute accidental poisonings (gas excepted).....	4
179	Accidental burns (conflagration excepted).....	5
181	Accidental absorption of irrespirable, irritating, or poisonous gas.....	3
182	Accidental drowning.....	1
183	Accidental traumatism by firearms (wounds of war excepted).....	5
185	Accidental traumatism by fall.....	15
186	Accidental traumatism in mines and quarries.....	1
187	Accidental traumatism by machines.....	1
188	Accidental traumatism by other crushing (vehicles, railways, landslides, etc.).....	3
194	Excessive heat.....	1
201	Fracture, cause not specified.....	8
202	Other external violence.....	1
203	Violent deaths of unknown causation.....	1
205	Cause of death not specified or ill-defined.....	4
	Total.....	814

NOTE.—This table does not include deaths of immigration patients in U. S. Marine Hospital No. 43, Ellis Island, N. Y.

TABLE 6.—Number of patients of each class of beneficiary discharged from United States marine hospitals and other relief stations during the fiscal year 1924, by broad groups of conditions

Group	Class of beneficiary													
	Ameri- can seamen	For- eign seamen	U. S. Coast Guard	U. S. Army	U. S. Navy and Marine Corps	Missis- sippi River Com- mission	Sea- men, U. S. Engi- neer Corps Army Trans- Port Service	U. S. Light- house and Service	U. S. Coast and Geo- detic Survey	U. S. Em- ploy- ees' Com- pensa- tion Com- mission	U. S. Veter- ans' Bureau	Dis- charged allied soldiers	U. S. Public Health Service officers and em- ployees	Miscel- laneous
Abnormalities and congenital mal- formations.....	17	10								2	4	1		
Blood and blood-forming organs, diseases and injuries of.....	37	21	4			1	1				8	1		
Bones and cartilages, diseases and injuries of.....	1,469	999	41		2	4	14	16	5	300	59		7	
Circulatory system, diseases and injuries of.....	949	658	41		1	10	23	17	5	19	158		11	
Communicable and infectious dis- eases, not including tuberculosis and venereal.....	1,539	1,042	137	3	9	50	46	23	8	8	22		61	1
Dental.....	140	87	24			2	3		2	4	14			
Digestive system, diseases and in- juries of.....	1,985	1,416	142	7	8	19	58	30	13	12	181		61	2
Ear, nose, and throat, diseases and injuries of.....	2,056	1,255	193	5	7	11	38	22	9	5	400	1	100	
Endocrines, diseases and injuries of. Eye and annex, diseases and in- juries of.....	134	79	6		1		2	6		4	33		1	
Genitourinary system, diseases and injuries of (exclusive of venereal). Hernia.....	231	144	19		1	1	8	4	1	23	31		3	
Joints and bursae, diseases and in- juries of.....	859	604	69	1	2	7	17	18	6	16	86		18	
Lymphatic system, diseases and injuries of.....	1,003	714	16		1	1	17	13	5	178	47		5	
Muscles, fasciae, tendons, and ten- don sheaths, diseases and in- juries of.....	874	579	50	2	1	5	12	6	2	75	122	2	1	9
Nervous system, diseases and in- juries of.....	327	281	8			3	5	3	3	2	6		2	
	827	542	83	3	2	7	18	10	2	115	13		18	1
	667	390	23	1	1	6	17	4	1	22	172	1	12	2



TABLE 7.—Number of days in hospital for patients discharged during fiscal year 1924 from United States marine hospitals and other relief stations, by broad groups of conditions and class of beneficiary

Group	Class of beneficiary														
	Total	American seamen	Foreign seamen	U. S. Coast Guard	U. S. Army	U. S. Navy and Marine Corps	Mississippi River Commission	Seamen, U. S. Engineer Corps and Army Transport Service	U. S. Light-house and Service	U. S. Coast and Geodetic Survey	U. S. employes, Veterans' Bureau	Discharged allied soldiers	U. S. Immigration and Service	U. S. Public Health Service officers and employees	Miscellaneous
Abnormalities and congenital malformations.....	1,242	367									497	300	78		
Blood and blood-forming organs, diseases and injuries of.....	1,872	1,057	9	305			6	11				451	33		
Bones and cartilages, diseases and injuries of.....	69,454	47,569	1,260	1,227		21	196	712	838	476	11,712	5,061		382	
Circulatory system, diseases and injuries of.....	42,476	32,468	183	1,442		4	251	1,896	311	110	840	4,738		233	
Communicable and infectious diseases, not including tuberculosis and venereal.....	65,390	24,900	1,151	1,365	75	84	652	1,061	301	60	180	871		1,176	4
Dental.....	2,022	1,335	29	219			34	50		18	56	281			
Digestive system, diseases and injuries of.....	45,936	32,067	868	2,827	234	146	223	1,396	1,244	293	388	5,003		14	25
Ear, nose, and throat, diseases and injuries of.....	28,712	18,411	117	2,707	22	36	165	444	492	88	151	5,205	37	34	
Endocrines, diseases and injuries of.....	6,773	5,027	137	155		5		52	127		53	1,215		2	
Eye and annexa, diseases and injuries of.....	7,749	6,103		315		25	4	42	53	1	428	719		57	
Genitourinary system, diseases and injuries of (exclusive of venereal).....	29,338	21,054	232	1,447	16	62	298	228	1,282	152	685	3,730		2	
Hernia.....	31,418	23,129	199	601		41	1	401	556	156	4,555	1,634		145	
Joints and bursæ, diseases and injuries of.....	40,751	28,147	357	1,721	41	15	119	783	74	122	2,135	7,004	85	25	
Lymphatic system, diseases and injuries of.....	10,465	9,291	330	250			113	104	66	47	31	178		48	
Muscles, fasciæ, tendons, and tendon sheaths, diseases and injuries of.....	16,041	10,763	287	1,655	19	4	98	236	202	14	2,262	308		187	6

	41,090	30,470	46	1,699	5	5	142	407	48	49	1,138	6,810	42	11	215	3
Nervous system, diseases and injuries of.....																
Obstetric and gynecological conditions.....	166	151									14				1	
Parasitic diseases.....	4,863	2,642	198	69			17	103	31		22	1,762		19		
Poisonings and intoxications.....	3,051	2,771	11	43	13	6	27	105	1		31	31			12	
Psychiatric diseases.....	37,912	29,673	11	974	2	11	11	23	1,192		239	5,411		365		
Respiratory system, diseases and injuries of (exclusive of tuberculosis).....	36,441	26,443	515	1,310	34	11	165	864	790	93	15	5,587	1	61	551	1
Skin and its appendages, diseases and injuries of.....	16,408	12,134	198	929	22	20	102	414	231	39	395	1,760		46	118	
Tuberculosis.....	153,470	105,692	406	5,283			473	1,226	826		2,825	15,921	57	215	544	2
Tumors.....	11,952	10,193	80	257				344	57	21	179	754		6	56	5
Veneral diseases.....	184,543	157,330	4,383	5,224	48	29	188	3,112	1,625	433	148	3,621		8,208	184	10
Inoculations.....	247	83		162											2	
Under observation.....	5,318	2,213	110	483	3	34	92	67		7	156	1,951	19	122	55	6
Miscellaneous.....	91,632	64,325	1,264	4,068	156	218	252	1,229	1,334	156	12,167	5,429	19	185	821	9
Total days.....	966,732	705,898	12,381	36,737	690	777	3,629	15,310	11,681	2,335	41,302	86,335	371	9,747	6,432	71

NOTE.—This table does not include immigration patients discharged from U. S. Marine Hospital No. 43, Ellis Island, N. Y.

TABLE 8.—*Classification of out-patient treatments furnished at United States marine hospitals and other relief stations, fiscal year 1924*

Station	General medical	Dental	Eye, ear, nose, and throat	Neuro-psychiatric	Tuberculosis	Surgical	Genito-urinary	Inoculations and vaccinations	X ray	Physiotherapy	Total
Marine hospitals.....	47,970	18,662	26,243	17	108	72,884	52,296	3,735	5,448	24,447	251,810
Other relief stations.....	51,435	6,299	7,756	154	245	39,684	22,048	6,894	1,601	15,938	152,054
Total.....	99,405	24,961	33,999	171	353	112,568	74,344	10,629	7,049	40,385	403,864

## DIVISION OF VENEREAL DISEASES

In charge of Asst. Surg. Gen. MARK J. WHITE

During the past year, as in previous years, the division of venereal diseases has performed those duties imposed by the law, namely: (1) To study and investigate the treatment and prevention of venereal diseases; (2) to cooperate with State boards of health for the prevention and control of such diseases within the States; and (3) to control and prevent the spread of these diseases in interstate traffic.

For some time careful consideration has been given to the question of prenatal syphilis. The data collected by the division of venereal diseases indicate that combating syphilis will be one of the most effective measures for increasing the number of births of healthy children. A memorandum, embracing the suggestions and opinions of several of the leading obstetricians of the United States, which had been solicited by the division, was sent through the State departments of health to obstetricians, private practitioners, public-health nurses, and prenatal and infant welfare workers urging them to institute careful examination for syphilis and pointing out to them the value of energetic treatment of pregnant women as well as the need for a long period of observation of both mother and child, should syphilis be present. The division is now engaged in gathering from the various States information as to measures employed to discover, treat, and follow up syphilis in pregnant women.

One of the inevitable results of the campaign for the control of venereal diseases has been the establishment of large numbers of clinics for indigent patients, and there has been an increasing demand for better facilities for diagnosing and treating these conditions. In order that the experiences of the various clinics might be of value in evolving a perfected technic, a study of the most successful clinics over the country was determined upon. At the conference of venereal-disease officers held in November, 1923, a committee was appointed to make an exhaustive study of clinics maintained for the treatment of venereal diseases. The purpose of the investigation was to determine the best methods of clinic administration and most approved technic for diagnosis and treatment, and to make recommendations to State and local health authorities based on these conclusions.

As disease prevention is the primary consideration in all public-health work, the program for the control of the venereal diseases must include measures for the protection of persons not yet infected. Among the most effective means of protection is reliable information. Therefore education is a necessary part of the program. Knowledge of the nature and of the dangers of these diseases to the individual, the race, and the community should have a place in every school curriculum. Lack of teachers properly prepared for this work of instruction has been keenly felt. In order to furnish teachers and



student teachers with suitable material for teaching purposes, the division has prepared a motion-picture film, "Science of Life." The method of presentation has been demonstrated by a special lecturer. Requests for the lecture and film showing have been made through the State boards of health for many of the universities and normal schools. Two hundred and twenty-six lectures and film showings have been given to a total audience of 74,881, in 12 States.

Another feature of the program of prevention has been the campaign among railroad workers in Florida. This campaign is important as a demonstration of what can be done in the control of venereal diseases in cooperation with large industrial organizations. A representative of the division of venereal diseases detailed to the State health department, cooperating with the officials of the railroad companies of Florida, conducted a campaign for the purpose of giving information relating to sexual hygiene, the danger and cost of venereal diseases, and the importance of prompt and adequate treatment. An effort was also made to interest the railroads in the maintenance of special clinics either in cooperation with their own hospitals or with the State board of health. The result has been the establishment of 12 clinics under the supervision of the State board of health, where railroad employees receive the best treatment at a nominal cost. The number of persons reached by means of lectures, exhibits, motion pictures, personal letters, and pamphlets was over 25,000. Similar work has been inaugurated in the State of Mississippi.

A study of importance begun during the past year is the analysis of a large number of case histories for the purpose of considering syphilis in relation to crime and delinquency. Special attention is being given this aspect of venereal diseases.

#### FEDERAL AND STATE APPROPRIATIONS

For the fiscal year 1924, Congress made an appropriation of \$227,353 to the division of venereal diseases, of which sum \$100,000 was allotted to State boards of health for cooperative work in the prevention and control of venereal diseases. Forty-five States received their allotments by complying with the regulations promulgated by the Secretary of the Treasury. Owing to lack of adequate legislation, the District of Columbia, Illinois, Utah, and Wyoming failed to qualify for their portion of this appropriation. The States, through legislative action or from other sources, had more than \$600,000 in addition to the Federal allotment for use in controlling venereal diseases in 1924. Table 1 gives the amount of the State appropriations and Federal allotments.

For the fiscal year 1925 an appropriation of \$149,000 was made by Congress for the division of venereal diseases. Of this sum \$25,000 is to be allotted to State boards of health which comply with the regulations of the Secretary of the Treasury.

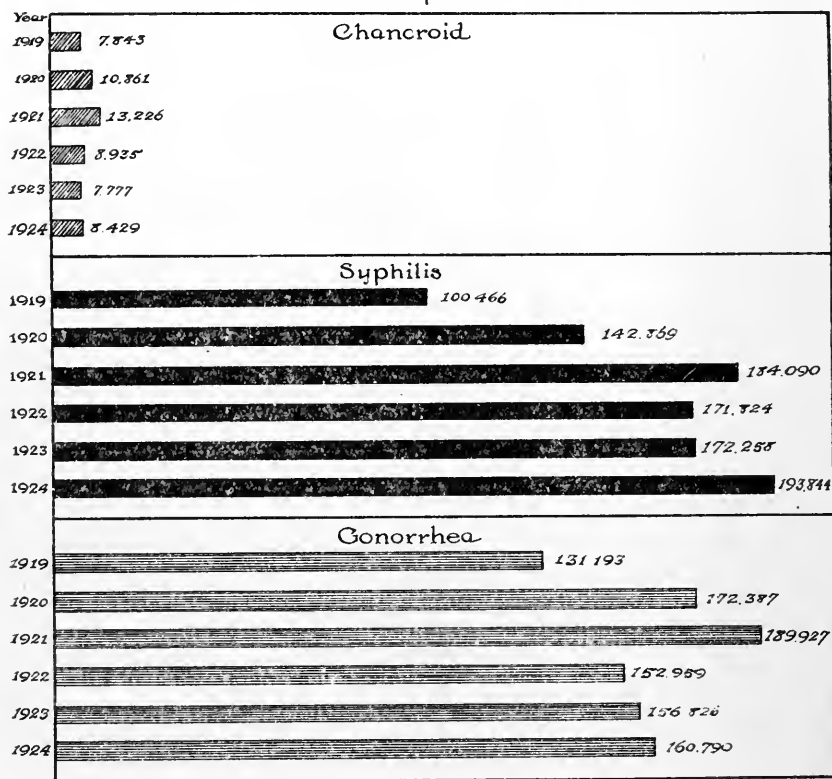
#### REPORTING OF VENEREAL DISEASES

The State boards of health recording cases of venereal diseases from all sources—clinics, penal, and correctional institutions, and physicians in private practice—reported a total of 363,063 cases of venereal

diseases in 1924, as shown in Table 2, an increase of 24,382 cases, or 7.2 per cent, over the number reported in 1923. The accompanying diagram indicates the progress in venereal-disease reporting since 1919.

Since the clinics report fewer new admissions than last year, the increase in cases reported must be credited to private physicians. This substantial increase in the number of cases reported by physicians is doubtless the result of an organized effort on the part of the State boards of health and the Public Health Service to interest physicians in the reporting of venereal diseases as a public-health

Cases of Venereal Diseases Reported to State Boards of Health



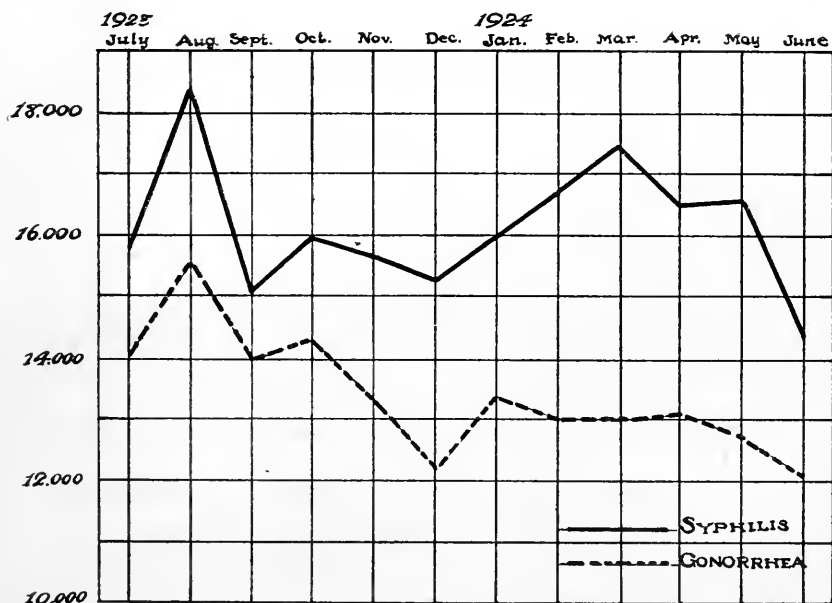
measure, since those States which have been most active in this respect show the largest returns in reports of diseases. Table 3 shows the States ranked according to the percentage of increase or decrease in the number of venereal-disease cases reported to State boards of health.

It is impossible to determine the true incidence of venereal diseases from data available, what percentage of the total number of cases existing should be reported each year, or what proportion of that total is actually being reported. It will require careful study of reports submitted over a series of years before conclusions approaching accuracy can be drawn. The present figures are an index of

progress in reporting rather than an index of the prevalence of disease. However, with the steady progress that is being made toward more efficient reporting, the several State boards of health and the Public Health Service will be enabled to collect and compile more accurate data regarding the prevalence of the venereal diseases. The graphs on pages 239 and 240 indicate the monthly variation in the cases of gonorrhea and syphilis reported in 1924.

### TREATMENT

Reports received from clinics, correspondence with physicians, and articles in the medical press, indicate that interest in the field of medical activities is maintained and that progress is being made in



Cases of Syphilis and Gonorrhea reported to  
State Boards of Health, by months.

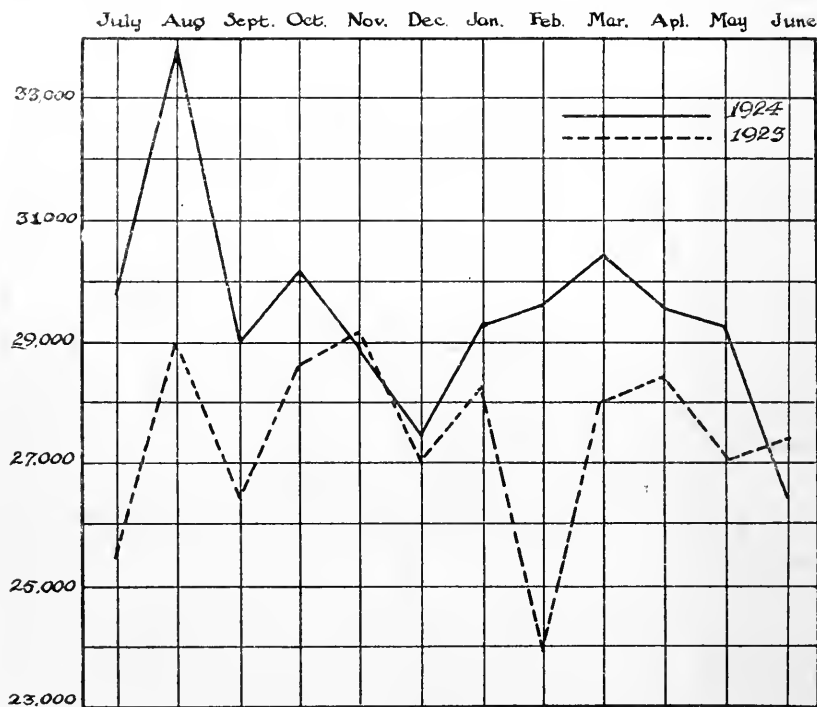
the treatment of the venereal diseases. During the year attention has been directed toward perfecting the treatment of syphilis and gonorrhea and methods of determining cure. While no new drugs have been suggested or new technic developed, there has been intensive study of the comparatively new drugs, sulfarsphenamin, tryparsamide, and bismuth for the treatment of syphilis, and the perfecting of the method of application of diathermy in the treatment of gonorrhea.

### CLINICS

While there has been practically no increase in the number of clinics operating nor in the number of new admissions to clinics, more persons have been kept under treatment during the past year

than during the previous year. More examinations and treatments per person admitted were given. The number of doses of arsphenamin administered, of Wassermann tests made, and of microscopic examinations for gonococcus were greater than the number for 1923.

Effort has been made to devise some plan for bringing scientific diagnosis and adequate treatment to the people of the small towns and the rural districts where the number of indigent persons requiring treatment is so small as to render the maintenance of a clinic impracticable. Several plans are being tried out. The plan of one State which has a very large rural population is to arrange with a



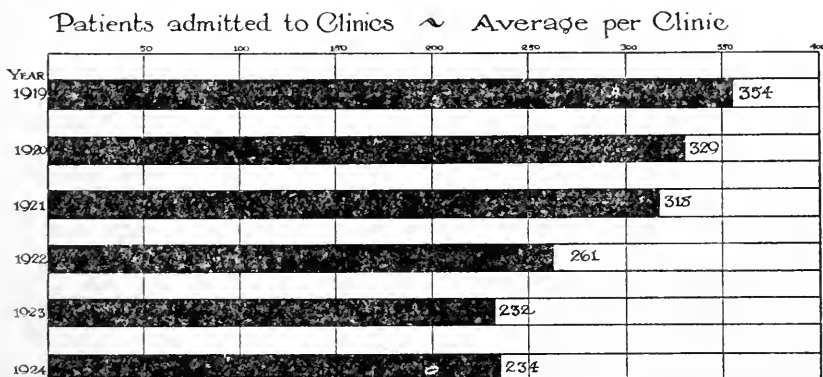
**Syphilis and Gonorrhea — Total cases reported to State Boards of Health by months and years**

private physician living in the community to treat the patient for a nominal fee which is paid by the State, the State also providing the arsphenamin necessary for the treatment. The plan of another State is to have a clinic centrally located serve several small communities, the State paying for the transportation of indigent patients and providing the arsphenamin for their treatment.

Five hundred and four clinics reported to the State boards of health. New cases admitted to these clinics totaled 118,023, an average of 234 to each clinic. The number of cases of syphilis reported was 65,046; gonorrhea, 49,028; and chancreoid, 3,949. Number of treatments given was 2,147,087; doses of arsphenamin

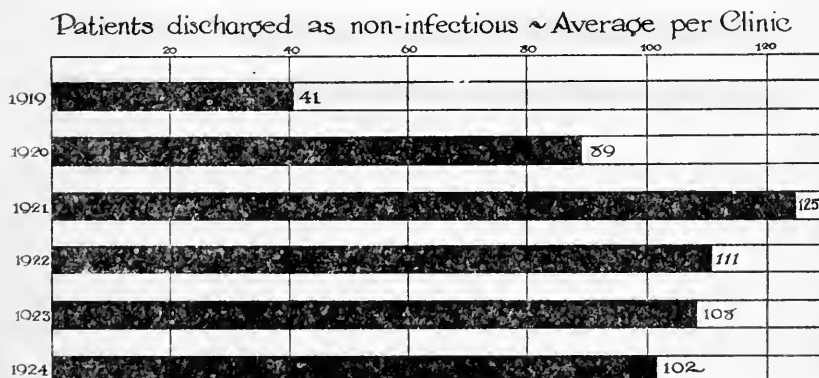
administered, 527,146; Wassermann tests, 302,152; and the number of examinations made for gonococcus infection was 203,008. A complete report of the clinics is presented in Table 4.

States ranked according to the monthly and daily average of admissions to the clinics are shown in Table 5.



#### CORRECTIONAL AND PENAL INSTITUTIONS

Reports from 37 correctional and penal institutions have been received by the division. The efforts of those in charge of these institutions have resulted in a large increase in the number of venereally diseased persons discovered and treated. Seven thousand and forty-five new patients were admitted to treatment in 1924, an increase of



44 per cent over 1923. The work of these institutions is shown in Table 6.

#### DISTRIBUTION OF ARSPHENAMIN

The State boards of health report the administration of 604,128 doses of arsphenamin or a similar product for the past year, an increase of 20,356 doses or 3.5 per cent over 1923. Table 7 gives the amounts administered by each State board of health. Of this amount 87.3 per cent was administered by the clinics and 12.7 per cent by

physicians for the treatment of indigent patients to whom clinic service was not accessible. The accompanying diagram illustrates the variation in the amount of arsphenamin administered through State boards of health in the last six years.

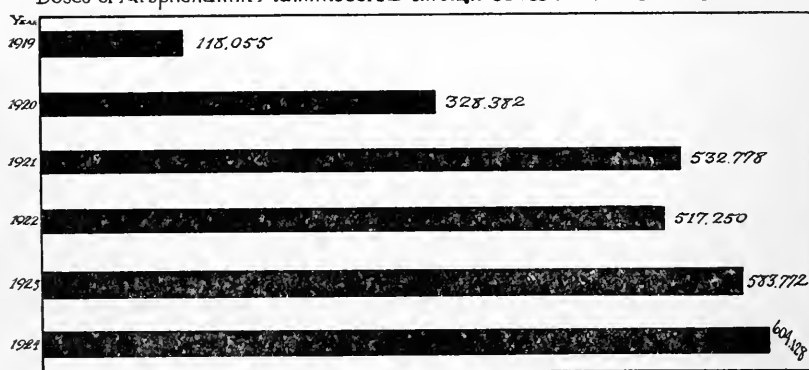
Three important studies of the arsenical preparations and their action upon the body have been made during the past year and have been published in Public Health Reports.

### MEDICAL INSTRUCTION

The Public Health Service clinic at Hot Springs, Ark., is maintained as a laboratory for the study of methods of diagnosis and treatment of the venereal diseases and for the study of clinic administration. An opportunity is afforded to physicians to do special work in the clinic. Fifteen physicians attended the clinic during the year.

Of 3,676 patients examined at the clinic, 1,447 had syphilis, 739 had gonorrhea, and 11 had chancroid. Total treatments given

Doses of Arsphenamin Administered through State Boards of Health



were 41,618. Wassermann tests for diagnosis and control of treatment totaled 4,671. Microscopic examinations for the control and treatment of gonorrhea totaled 2,165. Four hundred and twelve visits were made by the social-service worker. Special attention has been given to the matter of continuing, uninterrupted, the education of children with congenital syphilis during the period of their treatment. Five addresses were made by the social worker during the year before women's clubs on the venereal-disease problem.

### VENEREAL DISEASE INFORMATION

The bulletin Venereal Disease Information has been greatly enhanced in value because of the greater number of journals from other countries now abstracted. Approximately 300 journals are read; this number includes journals published in nine different languages. Articles written for this publication have been included which deal with special phases of treatment, and of administrative measures pertaining to the control of the venereal diseases. There are on file 3,000 abstracts of articles arranged so as to constitute a

subject index of the literature. From these cards special bibliographies are prepared in answer to requests. Compilations of abstracts on congenital syphilis and on syphilis of the nervous system have been assembled. Fifteen hundred of the former and four hundred of the latter have been distributed. Sixty medical journals, including a few foreign journals, are received in exchange for Venereal Disease Information.

### REQUESTS FOR MEDICAL ADVICE

The division has received 698 requests for medical advice. The requests come from persons who state that they have turned to the Public Health Service for help after having had their attention arrested by placards in trains or lavatories, by health columns, or advertisements in the newspapers.

### FIELD SERVICE

Pursuant to its policy of extending all possible cooperation and assistance to the States which are in need of and which ask for assistance in venereal-disease control work, the division maintains a field service. The personnel of this service is trained along the various lines of venereal-disease control. While it has not been possible to fill all the requests for the services of this field personnel that have been received by the division, a very large amount of work has been done with gratifying results. During the past year, in five States, regional consultants have worked with the officials of the State boards of health to further the plans for venereal-disease control in those States. In Kentucky and West Virginia efforts were directed toward the establishment of treatment centers throughout the States. In North Dakota, Pennsylvania, and Georgia a campaign of education in the grammar schools has been of chief interest, and an especial effort made to arouse interest through women's study groups.

The work with colleges and universities and with industries has been described elsewhere in this report.

### COMMUNITY PROGRAM

In cooperation with the District of Columbia health department, the division has been able to study the practical value of a lay educational program and to demonstrate how volunteer cooperation can most effectively aid the health department in the control of venereal diseases. Two courses of lectures were arranged, the health department and the division collaborating, for social workers and mothers, respectively. The lectures for the social workers contained a presentation of the venereal-disease situation, the health department's program of control, and outlines and suggestions as to the manner in which these workers might cooperate to make the program a success. These lectures, a series of six, were attended by public-health nurses, social workers from the various welfare organizations, volunteer workers, and representative delegates from the several women's organizations.

The lectures for mothers were arranged in order to bring before them the general effects of venereal diseases, the danger of their

spread, the treatment required, and the importance of adequate treatment.

A particular achievement has been the enlistment of public interest and understanding of the venereal-disease program. This has been accomplished through the stimulation of a civic organization. This organization has spent nearly \$2,000, raised by private subscription, in various projects directly or indirectly a part of the health department's program. Among these projects were the equipment, with motion-picture projector and screen, of the clinic waiting room; the organization of monthly meetings held in the various churches; the financing of special venereal-disease control activities in connection with the observance of Health Week; the purchase of equipment for outdoor motion-picture exhibitions; the purchase of a motion-picture film and several thousand pamphlets dealing with venereal-disease control; the production of a special reel of motion-picture film dealing with the local situation; and the provision of a special fund of \$500 for the use of the health department in employing a social worker for the follow-up of patients at the public venereal-disease clinic.

#### WORK WITH THE COLORED POPULATION

Four States were covered by the colored personnel of the division during the year: Mississippi, Missouri, Arkansas, and Alabama. A total of 492 meetings was reported, with an attendance of 82,173. In addition to the public meetings and lectures, the workers gave personal instructions in the technique of treatment of syphilis and gonorrhea to physicians practicing in isolated districts. Special lectures were given to nurses in hospitals and to county visiting nurses emphasizing the need for better education of patients and their families regarding the propagation and spread of the venereal diseases, and the importance of early diagnosis of syphilis in pregnant women.

A special card exhibit, Youth and Life, has been prepared for use in work with colored girls and young women. Two hundred copies of this exhibit have been distributed.

The division participated in the observance of the Tenth Annual Negro Health Week, held March 31 to April 5, 1924, collaborated in the preparation of the program and had this program printed at the Government Printing Office and made available for purchase at cost to State boards of health, private organizations, and individuals. Forty thousand copies of this program were distributed.

#### SOCIAL PATHOLOGY

The mimeographed bulletin Social Pathology is now in its fourth issue; the circulation has reached 3,500. This publication was developed for the purpose of acquainting the laity and civic organizations with the socio-economic conditions that have definite influence in the spread of the venereal diseases. The bulletin has been received with much interest and is meeting a great need. It has been found that the reading of the articles at a club or staff meeting stimulates consideration of such problems in the community. In this way similar conditions will become more fully understood and use of the knowledge thus gained will result in more effective cooperation with the health department in its program of venereal-disease control.



Among the articles which have appeared in the four issues of *Social Pathology* are the sociological aspects of syphilis, sex delinquency, juvenile delinquency, legal aspects of sex offenses, and the programs of control in several States and foreign countries. These articles have been contributed by persons who are not alone qualified to speak with authority upon their respective subjects but who are leaders in their particular fields.

The publication is edited by a woman physician who has had training and experience in this work. *Social Pathology* is supplied to the following:

- Health departments.
- Women's organizations.
- Juvenile courts.
- Chiefs of police and policewomen.
- Superintendents of houses of detention.
- Superintendents of State industrial homes and farms.
- Superintendents of public schools.
- Superintendents of institutions for the feeble-minded.
- Superintendents of orphanages.
- Deaconess homes.
- Florence Crittenden homes.
- Salvation Army homes.
- Social-service schools and agencies.
- Child-welfare organizations.
- Employees' welfare departments.
- Public-health nursing schools.

It is regretted that authority for printing this useful agency has been withheld by direction of the Bureau of the Budget.

### WORK WITH SCHOOLS

Three hundred and eighty-three conferences of high-school teachers were held on the subject of "Adolescence and sex education" with the aid of an exhibit furnished by the Public Health Service. These conferences were held in 25 different States, and there was a total attendance of 4,003, an average attendance of over 10 per conference. This total of persons reached is higher than in preceding years, when conferences of teachers were arranged by one or two field representatives; in 1922 the total attendance was 1,296, and in 1921, 3,851.

The largest number of conferences were held in Pennsylvania, where there were 80, and the next largest in Illinois, where there were 54. The reports from the 383 schools indicate that a gratifying degree of interest in the problem of sex education in high schools was created by the exhibit and the conferences and that the conferences would result, in many instances, in further study, in summer-school work on the part of teachers, in cooperative work with parents, and in the introduction of some sex education into the high-school curriculum. A comprehensive report of these conferences and the results of them is now being prepared.

### NEW PUBLICATIONS

Three card exhibits prepared during the previous year have now been published and distributed, as follows:

Adolescence and Sex Education—An exhibit for high-school teachers.

This is an exhibit of 34 cards, each 9 by 12 inches, and is in five parts:

1. The problems of adolescence;
2. The fruits of ignorance;
3. The scope of sex education;
4. Sex education in the courses of study;
5. The teacher and his training.

The Venereal Disease Menace—An exhibit for adults.

This exhibit presents facts regarding the venereal diseases for parents and leaders in the civic life of the community. A few years ago a similar exhibit on cards 22 by 28 inches was issued. The present exhibit consists almost entirely of new material, and to make it more readily available has been printed on convenient size cards, 9 by 12 inches. There are 50 such cards in the exhibit.

Youth and Life—An exhibit for colored girls and young women.

The interest shown in an adaptation for colored boys and young men of the "Keeping Fit" exhibit prompted the Public Health Service to publish an adaptation for colored girls and young women of the "Youth and Life" exhibit. The cards of the exhibit are illustrated with pictures of colored people. The appeal of the exhibit is for a better womanhood based on physical and mental fitness. The subject of venereal diseases, though limited to two cards, is handled adequately and in a dignified, constructive way that helps to build up the larger health ideal which is maintained throughout. The exhibit consists of 48 cards, each 9 by 12 inches.

A revised set of "Keeping Fit" lantern slides, consisting of 70 slides, was prepared. Arrangements were made to have these slides prepared by the Department of Agriculture, and 10 sets were purchased by the Public Health Service.

The following new publications have been issued during the fiscal year:

V. D. Bulletin No. 59B. The Wonderful Story of Life—A Father's Talks with His Little Son Regarding Life and Its Reproduction.

The pamphlet on "The Wonderful Story of Life," containing a mother's talks with her little daughter (V. D. Bulletin No. 59) proved so popular and useful that this similar pamphlet for the fathers of little boys was prepared.

V. D. Bulletin No. 74. The Need for Sex Education (including a revised list of books).

V. D. Bulletin No. 76. The Venereal Disease Handbook for Community Leaders.

This booklet takes the place of V. D. Bulletin No. 48, "How to Fight Venereal Diseases in Your City." It contains a full statement of the program for combating venereal diseases, and describes the medical, legal and educational measures which comprise this program.

Samples of new publications have been sent to the various State departments of health, which have been advised that additional copies may be purchased from the Government Printing Office at prices furnished. In the case of the Venereal Disease Handbook for Community Leaders, approximately 1,000 copies were distributed to the various State departments of health without charge.

### PAMPHLETS, FILM SHOWINGS, LECTURES, EXHIBITS

There has been a steady demand throughout the year for information and popular instruction. Requests for pamphlets received by the division and State boards of health totaled 41,775. The number of pamphlets distributed was 1,230,811. Requests for information and literature were received from 10 foreign countries.

State boards of health report the purchase of 967,452 pamphlets and placards. The accompanying diagram indicates the total purchases of the last six years.

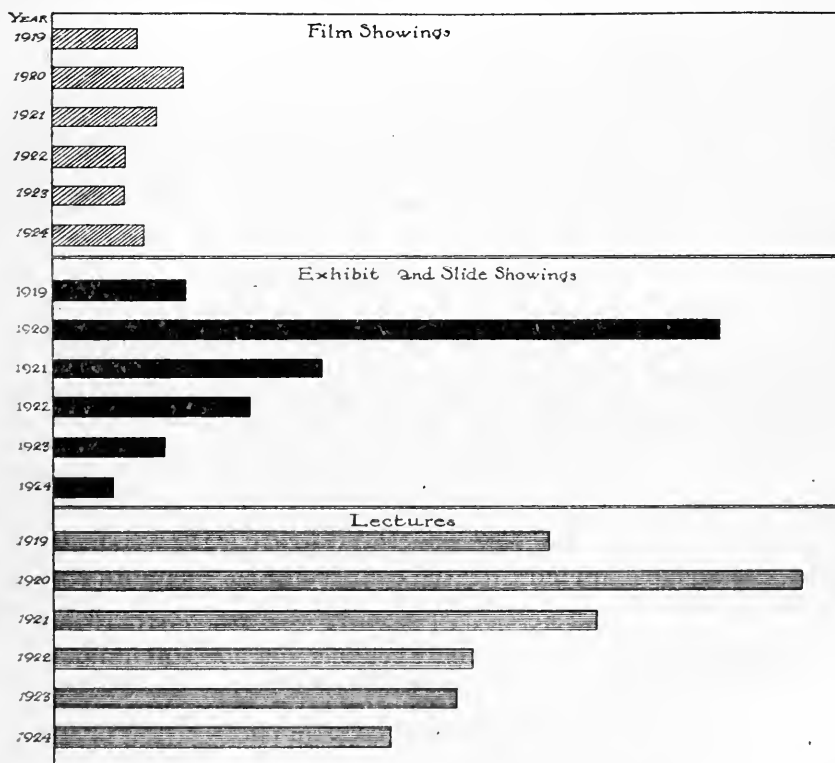
Table 8 contains reports of purchases by States of all pamphlets bought.

State boards of health borrowed or purchased 309 exhibits, 10 sets of slides, and 47 films. Table 9 lists these purchases by States.

Pamphlets and Placards Purchased and Reprinted by State Boards of Health

1919	10,510,524
1920	5,816,830
1921	4,081,697
1922	1,698,711
1923	1,513,201
1924	967,452

The number of film showings, lectures, and exhibits for the year 1924, compared with the numbers for the five previous years, is shown in the following diagram:



The American Social Hygiene Association reports the sale of 320 exhibits, 14 sets of slides, 111,884 pamphlets to State boards of health and others.

A statistical report of the educational activities of the State boards of health is shown in Table 10.

### INTERSTATE QUARANTINE

To control and prevent the spread of the venereal diseases in interstate travel is one of the duties specified in the act creating the division of venereal diseases. This control must necessarily be exercised under the provisions of the Federal quarantine act of 1893, which places primary optional responsibility of enforcement upon local health officers. It has been the policy of the division during the past year to inform and advise State and local health boards regarding the law and the departmental regulations under which venereally infected persons may engage in interstate travel, and to render advisory assistance in concrete cases.

There appeared in the December number of the division publication, Venereal Disease Information, an analysis of the interstate law as it relates to the venereal diseases, a statement of the procedural steps in its enforcement, and a résumé of cases involving its violation. In response to requests from State boards of health, a reprint of this article was made and distributed to State and local health officers.

The law and regulations were tested during the year in the Supreme Court of the District of Columbia. The defendant in this particular case was first given a hearing before a United States commissioner, subsequently indicted by a grand jury, and on arraignment entered a plea of guilty. The court, after referring the case to the probation officer for advice, imposed the maximum jail sentence of one year in the District workhouse, with instructions that defendant's infection be treated during her term of detention.

### STATE LAWS AND REGULATIONS

#### COURT DECISIONS

There has been a marked decrease during the year in the volume of litigation involving the constitutionality of State laws and regulations and local ordinances on the subject of the venereal diseases. This decrease is due, no doubt, to the cumulative effect of prior decisions of courts of last resort in sustaining the validity of special control acts and measures. From the legal point of view one of the troublesome questions involves an interpretation of what constitutes "reasonable ground" for the enforcement of quarantine measures against a person suspected of being infected. The Supreme Court of California, in *Ex parte Clemente* (215 Pac. 698), ruled that information that a woman not only conducted a house of ill fame but personally participated in the unlawful acts carried on therein, furnishes reasonable ground to believe that she is affected with an infectious disease, and the health officer is, in law, justified in enforcing quarantine measures against her. In *Ex parte Irby* and *Ex parte Hollowell* (215 Pac. 449, 450) the Supreme Court of Kansas in interpreting a city ordinance providing that a woman afflicted with venereal disease may be released by the city physician upon her making affidavit that she is not a prostitute and giving bond not to

expose any other person to infection, held that the ordinance does not compel release on presentation of affidavit and bond but simply authorizes her release if in the judgment of the city physician the public welfare will not suffer thereby. In *Nyberg v. Board of Commissioners* (216 Pac. 282) the Kansas court sustained a health officer in an action brought by him to require the sheriff to execute, and the board of county commissioners to pay for executing, an order isolating a woman affected with venereal disease at a State industrial farm.

#### LEGISLATION

Since all health jurisdictions (State) with the exception of the District of Columbia now have laws or State board of health rules on the subject of the venereal diseases, and, also, perhaps since few State legislatures convened during the past year, no amendments or supplementary laws, so far as the division is advised, were enacted. Another unsuccessful effort was made by interested persons to secure from Congress a venereal disease control law for the District of Columbia. A favorable committee report is pending, but no vote was had upon the reported bill during the session which adjourned in June.

#### VICE-REPRESSIVE MEASURES

With a view to impressing parents and others who may have to deal with problems of sex delinquency that the law, as one type of social control, does not countenance sexual misconduct, the division published an article in *Social Pathology* containing brief, nontechnical definitions of the more common sex offenses. The article appeared in the third number of this division publication under the title "Legal aspects of sex offenses."

The injunction and abatement law (in force in some form in at least 40 States) has been and is still being effectively used in abating disorderly houses as public nuisances. The law is occasionally challenged in the higher courts on the theory that it confers criminal jurisdiction on the equity courts, but this contention has not met with judicial favor except in New Jersey. One of the more recent decisions sustaining the validity of the law is that of *State v. Morris* (214 Pac. 332), announced by the Supreme Court of Montana.

During the year the division distributed mimeographed copies of *King v. Commonwealth* (238 SW. 373), a Kentucky case holding that the State law providing for the abatement of houses of lewdness, assignation, and prostitution by injunction is constitutional and valid.

TABLE 1.—*Federal allotments and State appropriations for venereal-disease prevention work for the fiscal year 1924*

State	State approp- riation	Federal allotment	Total amount available
United States.....	\$667,914.51	\$92,842.11	\$760,756.62
Alabama.....	2,221.32	2,221.32	4,442.64
Arizona.....	316.12	316.12	632.24
Arkansas.....	12,500.00	1,657.55	14,157.55
California.....	7,293.91	3,241.74	10,535.65
Colorado.....	<sup>1</sup> 32,000.00	888.87	32,888.87
Connecticut.....	10,000.00	1,306.05	11,306.05
Delaware.....	2,000.00	210.96	2,210.96
District of Columbia.....			
Florida.....	916.16	916.16	1,832.32
Georgia.....	10,000.00	2,739.40	12,739.40
Idaho.....	408.54	408.54	817.08
Illinois.....			
Indiana.....	<sup>2</sup> 37,000.00	2,772.08	39,772.08
Iowa.....	25,000.00	2,274.15	27,274.15
Kansas.....	3,000.00	1,673.68	4,673.68
Kentucky.....	20,000.00	2,286.08	22,286.08
Louisiana.....	12,500.00	1,701.35	14,201.35
Maine.....	10,000.00	726.52	10,726.52
Maryland.....	25,920.00	1,371.35	27,291.35
Massachusetts.....	70,940.00	3,644.24	74,584.24
Michigan.....	38,700.00	3,470.24	42,170.24
Minnesota.....	25,000.00	2,258.17	27,258.17
Mississippi.....	16,000.00	1,693.88	17,693.88
Missouri.....	3,220.16	3,220.16	6,440.32
Montana.....	2,500.00	519.24	3,019.24
Nebraska.....	6,280.00	1,226.34	7,506.34
Nevada.....	329.50	73.22	402.72
New Hampshire.....	6,000.00	419.15	6,419.15
New Jersey.....	25,000.00	2,985.41	27,985.41
New Mexico.....	1,944.00	340.88	2,284.88
New York.....	<sup>3</sup> 47,000.00	9,824.20	56,824.20
North Carolina.....	5,446.97	2,420.88	7,867.85
North Dakota.....	6,274.24	611.93	6,886.17
Ohio.....	25,000.00	5,448.26	30,448.26
Oklahoma.....	25,000.00	1,918.71	26,918.71
Oregon.....	5,000.00	741.07	5,741.07
Pennsylvania.....	38,000.00	8,248.95	46,248.95
Rhode Island.....	7,500.00	571.75	8,071.75
South Carolina.....	<sup>2</sup> 8,407.23	1,592.77	10,000.00
South Dakota.....	602.16	602.16	1,204.32
Tennessee.....	15,571.30	2,211.59	17,782.89
Texas.....	4,411.32	4,411.32	8,822.64
Utah.....			
Vermont.....	4,000.00	333.39	4,333.39
Virginia.....	7,433.68	2,184.44	9,618.12
Washington.....	3,907.90	1,293.33	5,191.23
West Virginia.....	21,000.00	1,384.63	22,384.63
Wisconsin.....	36,370.00	2,489.88	38,859.88
Wyoming.....			

<sup>1</sup> Includes \$12,000 for detention homes.<sup>2</sup> Approximately.<sup>3</sup> Exclusive of New York City.

TABLE 2.—Cases of venereal diseases reported to State boards of health, July 1, 1923, to June 30, 1924

State	Total	Syphilis	Gonorrhea	Chancroid
United States.....	363,063	193,844	160,790	8,429
Alabama.....	11,597	6,816	4,505	276
Arizona.....	366	220	134	12
Arkansas.....	4,488	2,522	1,876	90
California.....	25,099	15,387	9,410	302
Colorado.....	2,615	944	1,587	84
Connecticut.....	1,983	1,129	854	(1)
Delaware.....	710 <sup>2</sup>	196	418	96
District of Columbia <sup>3</sup> .....	836	482	347	7
Florida.....	5,155	2,930	2,006	219
Georgia.....	9,990	5,598	3,917	475
Idaho.....	380	102	276	2
Illinois.....	29,043	10,364	17,775	904
Indiana.....	4,249	1,930	2,179	140
Iowa.....	3,725	1,353	2,344	28
Kansas.....	2,797	1,242	1,544	11
Kentucky.....	37,145	26,001	10,659	485
Louisiana.....	8,164	4,274	3,320	570
Maine.....	1,113	380	721	12
Maryland.....	5,546	2,541	2,628	377
Massachusetts.....	13,469	5,649	7,814	6
Michigan.....	22,401	12,104	10,062	235
Minnesota.....	11,708	5,201	6,438	69
Mississippi.....	20,510	8,256	12,211	43
Missouri.....	8,922	3,727	4,175	1,020
Montana.....	602	353	248	1
Nebraska.....	3,939	1,197	2,617	125
Nevada <sup>4</sup> .....	.....	.....	.....	.....
New Hampshire.....	442	182	260	.....
New Jersey.....	6,153	3,469	2,617	67
New Mexico.....	389	105	282	2
New York.....	38,714	27,344	11,201	169
North Carolina.....	6,129	3,189	2,733	207
North Dakota.....	909	246	663	.....
Ohio <sup>5</sup> .....	10,582	5,713	4,438	431
Oklahoma.....	6,360	3,616	2,669	75
Oregon.....	2,626	694	1,887	45
Pennsylvania.....	5,015	2,631	2,252	132
Rhode Island.....	1,076	414	656	6
South Carolina.....	4,073	1,995	1,993	85
South Dakota.....	787	138	643	6
Tennessee.....	6,296	3,410	2,412	474
Texas <sup>6</sup> .....	22,344	12,964	8,501	879
Utah <sup>6</sup> .....	79	25	52	2
Vermont.....	598	254	344	.....
Virginia.....	3,568	2,071	1,420	77
Washington.....	1,628	655	973	.....
West Virginia.....	5,755	3,114	2,481	160
Wisconsin.....	2,941	685	2,233	23
Wyoming <sup>7</sup> .....	47	32	15	.....

<sup>1</sup> Included in syphilis.<sup>2</sup> From health department clinic reports.<sup>3</sup> Not reporting.<sup>4</sup> From clinic reports.<sup>5</sup> For 11 months only.<sup>6</sup> From clinic reports; for two months only. Clinic at Salt Lake City reopened beginning May, 1924.<sup>7</sup> From clinic reports; for five months only.

TABLE 3.—States ranked according to the percentage of increase or decrease in the number of cases of venereal diseases reported to State boards of health, 1924 over 1923

## STATES SHOWING INCREASE

Rank	State	Per cent	Rank	State	Per cent
1	Oklahoma.....	154.71	14	Illinois.....	9.58
2	California.....	127.06	15	Ohio (incomplete).....	8.05
3	Florida.....	51.74	16	Minnesota.....	7.09
4	Connecticut.....	48.65	17	Iowa.....	6.76
5	Idaho.....	44.49	18	New York.....	6.66
6	Vermont.....	22.79	19	Louisiana.....	6.44
7	Mississippi.....	21.50	20	Colorado.....	6.30
8	Delaware.....	18.73	21	Massachusetts.....	4.64
9	Michigan.....	18.65	22	New Hampshire.....	4.25
10	New Jersey.....	18.15	23	Washington.....	3.50
11	West Virginia.....	15.52	24	Montana.....	2.73
12	Kentucky.....	11.84	25	Alabama.....	2.22
13	Rhode Island.....	11.04	26	Georgia.....	2.14

## STATES SHOWING DECREASE

27	Kansas.....	1.41	37	Maine.....	15.49
28	Maryland.....	1.46	38	South Carolina.....	16.31
29	Wisconsin.....	3.73	39	Virginia.....	16.56
30	South Dakota.....	4.26	40	North Dakota.....	17.29
31	New Mexico.....	4.89	41	Oregon.....	18.17
32	Tennessee.....	8.25	42	Pennsylvania.....	18.72
33	Indiana.....	10.90	43	Texas (incomplete).....	23.24
34	Nebraska.....	12.29	44	North Carolina.....	24.02
35	Missouri.....	14.00	45	District of Columbia.....	55.60
36	Arkansas.....	14.81			

<sup>1</sup> 1923 figures are for 11 months only.<sup>2</sup> 1924 figures are for 11 months only.

NOTE.—Owing to the temporary discontinuation of venereal disease work in Utah, and the incomplete returns from Arizona in 1923 and Wyoming in 1924, the figures for these three States are not comparable and have been omitted from the above table.

TABLE 4.—Report of clinics, including those operating under the joint control of the United States Public Health Service and State boards of health, July 1, 1923, to June 30, 1924.

State and city	Total monthly reports received	Patients admitted				Patients discharged as non-infectious	Treatments given	Doses of arsenphenamin administered	Wassermann tests made	Microscopic examinations, gonococcus
		Total	Syphilis	Gonorrhea	Chancroid					
United States.....	5,399	118,023	65,046	49,028	3,949	51,658	2,147,087	527,146	302,452	203,008
Alabama.....	160	8,205	5,376	2,685	144	3,853	98,010	38,189	11,286	1,869
Albany.....	12	100	79	20	1	18	1,235	470	223	107
Bessemer.....	12	156	128	28	—	93	1,708	798	195	43
Birmingham (2).....	24	2,508	1,958	548	2	1,033	28,448	11,723	4,270	295
Eufaula.....	12	165	61	87	17	171	2,102	526	4	—
Gadsden.....	12	185	68	113	4	101	2,453	780	93	31
Huntsville.....	12	457	131	299	27	296	4,682	1,335	685	302
Mobile.....	12	1,083	819	258	6	233	23,393	9,617	570	76
Montgomery.....	12	510	249	254	7	17	4,197	1,284	150	—
Riderwood.....	11	154	53	97	4	73	496	275	34	4
Selma.....	12	153	121	31	1	32	2,567	658	259	3
Talladega.....	5	57	34	21	2	38	571	146	67	3
Tuscaloosa.....	12	325	278	47	—	118	6,903	1,965	391	183
Cooperative.....	12	2,352	1,397	882	73	1,630	19,855	8,612	1,750	822

<sup>1</sup> Includes 2,595 Wassermann tests not reported individually by clinics.



TABLE 4.—Report of clinics, including those operating under the joint control of the United States Public Health Service and State boards of health, July 1, 1923, to June 30, 1924.—Continued.

State and city	Total monthly reports received	Patients admitted				Patients discharged as non-infectious	Treatments given	Doses of arsenphenamin administered	Wassermann tests made	Microscopic examinations, gonococcus
		Total	Syph.	Gonorrhea	Chan. crock.					
Arkansas	93	2,982	1,964	974	144	2,026	52,628	11,927	7,495	2,914
Fort Smith	201	12 15	15	98	24	917	51 254	253	57	101 3
Hot Springs (2)	100	24 158	1,392	186	10	1,663	41 784	9,497	4,860	2,156
Little Rock	67	12 470	122	13	3	6043	6 181	1,066	2,092	116 464
North Little Rock	112	12 86	245	02	0	811	216	137	57	19 19
Pine Bluff	112	12 104	12	2	0	811	305	155	12	2 2
Texasarkana	67	12 197	58	16	23	206	1 254	302	232	19 52
West Helena	114	12 208	24	76	0	162	2 634	517	110	19 118
California	131	6,800	3,670	2,393	87	5,896	100,409	33,605	19,852	11,427
Fresno	12	307	131	166	10	105	8 637	329	708	9 1747
Los Angeles (3)	36	3,723	2,201	1,518	14	3,140	40 331	12,946	6,729	2 1424
Oakland	110	12 493	217	275	0	5 988	2 252	2,252	1,486	0 205
San Diego	101	12 238	116	63	139	143	8 367	1,080	618	1 302
San Francisco	36	1,438	773	656	19	246	34 923	14,292	9,109	2 697
San Jose	11	39	28	11	0	10	943	216	363	1 438
Stockton	12	362	204	158	4	58	11 220	990	700	14
Colorado	104	1,012	499	492	21	516	16,106	3,775	1,702	1,236
Buena Vista	12	13	10	13	0	18	51 264	170	248	1 2
Colorado Springs	12	138	121	65	12	12	51 764	187	161	1 334
Denver (2)	24	1,067	366	296	0	821	8 403	2,343	1,078	1 552
Fort Collins	12	578	10	65	3	80 57	2 292	79	30 24	1 113
Greeley	12	12	12	12	12	12	1 387	60	80	1 149
Leadville	12	205	6	11	12	20 25	1 089	26	210 23	1 32
Pueblo	12	138	75	165	1	50	2 611	725	317	1 454
Trinidad	12	16	10	6	0	11	1 296	185	11	1 1
Connecticut	72	870	369	476	25	800	16,794	4,441	1,769	1 710
Bridgeport	12	128	76	52	11	62	3 479	995	342	1 128
Hartford	12	231	63	163	5	69	3 457	1,024	170	1 358
New Haven	12	158	96	62	0	21	4 750	1,510	878	1 128
New London	12	26	17	9	0	21	681	226	91	1 63
Stamford	12	279	93	171	15	240	1 764	427	486	1 001
Waterbury	12	48	24	19	0	16	1 723	250	32	1 82
Delaware	37	249	122	117	10	94	3,339	832	337	1 251
Dover	10	83	31	34	0	13	51 659	199	86	1 66
Wilmington (2)	17	466	91	173	2	51	2 680	633	271	1 185
District of Columbia	1	1	1	1	1	1	1	1	1	1
Washington (health department)	12	536	482	347	7	37	2,840	3,547	3,888	1 045
Florida	102	1,452	781	295	76	696	10,301	3,276	2,379	628
Altamonte	11	66	30	36	0	74	275	96	91	1 43
Arcadia	12	85	136	139	110	55	1 126	334	91	1 120
Fort Pierce	11	74	134	32	8	56	862	256	108	1 135
Inverness	12	1	1	1	1	4	16	9	21	1 1
Jacksonville	12	223	205	104	12	114	2 712	974	7 04	1 110
Miami	12	22	17	5	8	21	95	80	38	1 6
Millville	12	174	137	103	4	13	347	245	95	1 120
Ocala	11	6	3	1	0	1	51	31	31	1 14
Perry	12	220	100	73	47	134	1 795	95	7	8
Tampa	12	228	210	16	2	103	2 869	1,082	1,000	1 167
Vauchula	12	53	9	44	0	61	573	74	38	124
Georgia	84	3,402	2,477	676	149	1,790	34,984	14,193	8,849	1 036
Atlanta	12	208	1,180	28	0	0	10 136	5,056	4,352	1 000
Augusta	12	246	79	152	25	9	9 725	1,184	1,456	1 352
Brunswick	12	62	01	1	16	25	1 458	10 968	270	1 171
Columbus	12	609	135	70	104	180	5 022	819	222	1 148
Macon	12	840	397	336	117	202	16 849	3,177	876	1 887
Rome	12	503	55	46	2	118	914	321	163	1 147
Savannah	12	134	580	43	11	431	3 880	3,438	1,517	1 141

TABLE 4.—*Report of clinics, including those operating under the joint control of the United States Public Health Service and State boards of health, July 1, 1923, to June 30, 1924—Continued.*

State and city	Total monthly reports received	Patients admitted				Patients discharged as non-infectious	Treatments given	Doses of ar-sphen-amin administered	Was-ser-mann tests made	Micro-scopic examina-tions, gon-ococcus
		Total	Syph-illis	Gono-rhea	Chan-croid					
Illinois.....	280	10,165	4,004	5,725	436	4,327	284,429	39,344	27,369	33,156
Alton.....	12	149	48	89	12	84	3,007	198	164	254
Cairo.....	12	112	82	30	-----	110	1,900	1,138	377	60
Carlinville.....	12	65	24	38	3	67	1,736	243	37	-----
Chicago (10).....	109	8,148	2,985	4,789	374	2,993	240,514	25,491	24,209	29,347
Decatur.....	12	118	81	37	-----	104	2,614	694	195	352
Du Quoin.....	3	8	5	3	-----	2	33	13	9	14
East St. Louis.....	12	380	170	179	31	181	5,411	446	407	662
Litchfield.....	12	37	8	28	1	8	2,035	152	80	333
Moline.....	12	87	43	44	-----	91	2,284	1,565	172	89
Peoria.....	12	323	204	113	6	142	3,117	922	600	1,004
Princeton.....	12	10	3	5	2	12	124	79	19	14
Quincy.....	12	72	24	45	3	38	2,606	383	140	227
Rockford.....	12	75	30	45	-----	46	1,611	598	201	110
Rock Island.....	12	164	61	103	-----	150	5,102	2,521	295	352
Springfield.....	12	380	221	158	1	276	9,250	4,794	440	336
West Hammond.....	12	37	15	19	3	23	3,085	107	24	2
Indiana.....	204	3,307	1,495	1,681	131	1,223	146,519	18,499	7,420	2,724
Anderson.....	12	183	61	122	-----	56	4,421	813	415	266
Columbus.....	12	23	6	17	-----	6	863	113	32	29
Elwood.....	12	48	11	36	1	13	932	153	61	37
Evansville.....	12	526	236	270	20	211	9,721	2,515	880	276
Fort Wayne.....	12	208	78	127	3	120	4,235	812	463	386
Hammond.....	12	260	84	142	34	133	6,224	650	322	33
Indianapolis (2).....	24	966	484	437	45	108	99,634	4,598	2,331	624
Kokomo.....	12	74	43	31	-----	11	642	464	63	37
Madison.....	12	51	7	40	4	34	807	73	24	20
Marion.....	12	42	22	20	-----	77	1,603	653	37	-----
Michigan City.....	12	50	23	16	11	23	438	172	86	142
Muncie.....	12	136	61	75	-----	52	2,083	750	137	91
New Castle.....	12	39	17	20	2	22	264	253	252	70
Richmond.....	12	30	17	13	-----	20	679	493	149	31
South Bend.....	12	232	130	96	6	126	6,895	3,104	1,251	386
Terre Haute.....	12	439	215	219	5	211	7,078	2,883	917	296
Iowa.....	100	1,244	706	534	4	638	22,569	6,742	2,665	1,897
Clinton.....	12	53	22	29	2	38	517	148	58	10
Council Bluffs.....	3	11	5	6	-----	11	176	41	21	12
Davenport.....	12	219	153	66	-----	80	2,027	1,186	777	168
Des Moines.....	12	636	352	284	-----	192	16,330	3,231	1,214	1,010
Dubuque.....	12	44	24	19	1	35	401	307	90	47
Fort Dodge.....	11	15	4	10	1	4	376	69	8	15
Marshalltown.....	9	42	2	40	-----	44	333	11	4	236
Ottumwa.....	12	79	63	16	-----	96	686	502	145	59
Sioux City (2).....	17	145	81	64	-----	138	1,723	1,187	348	340
Kansas.....	104	906	610	285	11	280	13,880	5,077	2,448	1,167
Coffeyville.....	4	19	17	1	1	7	118	70	23	1
El Dorado.....	5	25	12	12	1	12	185	45	20	27
Junction City.....	12	-----	-----	-----	-----	-----	74	23	46	67
Kansas City (3).....	35	444	337	102	5	23	3,805	1,853	860	78
Lawrence.....	12	20	8	10	2	4	364	5	71	115
Topeka.....	12	95	67	26	2	45	3,112	1,240	385	152
Wichita (2).....	24	303	169	134	-----	189	6,222	1,841	1,043	727
Kentucky.....	183	5,077	2,542	2,343	192	1,993	60,920	18,066	6,604	2,911
Ashland.....	12	183	112	71	-----	15	5,560	2,576	365	1,154
Covington.....	12	191	85	101	5	203	3,185	539	244	36
Frankfort.....	12	1,023	570	453	-----	978	6,436	4,235	1,347	-----
Georgetown.....	12	70	46	24	-----	81	1,356	675	205	52
Henderson.....	12	39	38	1	-----	8	1,104	458	257	2
Hickman and Fulton.....	12	50	31	19	-----	15	561	358	86	38
Lexington.....	12	581	369	208	4	236	8,977	2,508	1,525	509
Louisville (2).....	24	2,335	937	1,246	152	116	23,684	3,889	1,073	382
Maysville.....	12	18	8	10	-----	32	268	9	25	2
Mount Sterling.....	9	30	15	13	2	44	134	38	35	7
Newport.....	11	204	72	113	19	153	3,981	419	399	453

TABLE 4.—*Report of clinics, including those operating under the joint control of the United States Public Health Service and State boards of health, July 1, 1923, to June 30, 1924—Continued.*

State and city	Total monthly reports received	Patients admitted				Patients discharged as non-infectious	Treatments given	Doses of ar-sphen-amin administered	Wassermann tests made	Microscopic examinations, gonococcus
		Total	Syphilis	Gonorrhea	Chan-roid					
<b>Kentucky—Contd.</b>										
Owensboro.....	12	63	57	5	1	9	851	636	215	51
Paducah.....	3	49	27	21	1	8	336	112	67	6
Paintsville.....	9	14	12	2	-----	1	152	148	31	5
Pineville and Middle-boro.....	7	76	44	26	6	42	1,287	404	302	66
Winchester.....	12	151	119	30	2	52	3,048	1,062	428	148
<b>Louisiana.....</b>	<b>83</b>	<b>6,498</b>	<b>3,798</b>	<b>2,325</b>	<b>375</b>	<b>3,010</b>	<b>55,873</b>	<b>20,125</b>	<b>6,894</b>	<b>2,934</b>
Alexandria.....	12	1,258	627	528	103	558	9,772	1,681	780	810
Baton Rouge.....	11	237	137	71	29	84	2,727	394	96	89
Monroe.....	12	496	468	26	2	509	5,452	5,217	942	44
New Orleans (2).....	24	3,319	1,753	1,383	183	707	29,185	8,780	3,949	1,019
Shreveport (2).....	24	1,188	813	317	58	1,152	8,737	4,053	1,127	972
<b>Maine.....</b>	<b>52</b>	<b>361</b>	<b>248</b>	<b>102</b>	<b>11</b>	<b>202</b>	<b>4,962</b>	<b>2,587</b>	<b>680</b>	<b>288</b>
Bangor.....	12	126	108	18	-----	104	1,411	811	99	21
Bath.....	12	6	2	4	-----	-----	336	56	133	98
Calais.....	12	41	25	16	-----	46	943	398	179	1
Portland (2).....	16	188	113	64	11	52	2,272	1,322	269	168
<b>Maryland.....</b>	<b>122</b>	<b>2,375</b>	<b>902</b>	<b>1,294</b>	<b>179</b>	<b>1,237</b>	<b>46,971</b>	<b>11,963</b>	<b>3,647</b>	<b>4,210</b>
Annapolis.....	12	157	55	100	2	154	1,762	380	155	196
Baltimore (3).....	36	1,659	656	838	165	824	31,151	8,939	2,578	1,778
Cambridge.....	10	68	28	36	4	27	626	234	61	15
Crisfield.....	12	66	19	47	-----	56	695	228	56	127
Cumberland.....	12	195	56	134	5	93	9,706	800	322	716
Easton.....	4	23	20	3	-----	11	402	369	64	3
Elkton.....	3	3	3	-----	-----	-----	17	17	3	-----
Hagerstown.....	12	158	52	106	-----	48	2,187	794	330	1,362
Havre de Grace.....	1	5	-----	5	-----	-----	-----	-----	4	-----
Hughesville.....	6	17	6	10	1	17	268	64	19	1
Prince Frederick.....	2	7	-----	7	-----	-----	-----	-----	-----	-----
Rockville.....	10	7	2	4	1	7	113	103	21	4
Salisbury.....	2	10	5	4	1	-----	44	35	34	8
<b>Massachusetts.....</b>	<b>428</b>	<b>5,833</b>	<b>3,205</b>	<b>2,624</b>	<b>4</b>	<b>1,435</b>	<b>149,713</b>	<b>45,710</b>	<b>23,133</b>	<b>17,554</b>
Attleboro.....	10	14	6	8	-----	1	293	154	43	10
Boston (9).....	100	3,909	2,068	1,841	-----	666	98,991	31,638	13,709	15,372
Brocton.....	11	31	19	12	-----	28	1,052	438	163	19
Cambridge.....	3	12	10	2	-----	-----	22	15	12	-----
Canton.....	12	11	2	9	-----	17	2,310	61	26	29
Fall River.....	12	135	50	85	-----	28	6,114	687	225	437
Fitchburg.....	12	52	22	30	-----	14	736	436	55	42
Framingham.....	9	-----	-----	-----	-----	-----	12	12	1	-----
Hathorne.....	12	69	69	-----	-----	7	1,949	997	964	15
Haverhill.....	12	76	29	47	-----	23	2,048	449	76	36
Holyoke.....	12	57	34	23	-----	49	1,051	436	88	12
Lawrence.....	12	127	60	67	-----	-----	2,271	524	183	-----
Lowell.....	12	174	84	89	1	56	3,781	636	595	253
Lynn.....	12	59	26	33	-----	6	2,278	586	186	51
Medfield.....	12	14	13	1	-----	38	677	160	244	5
Monson.....	10	4	4	-----	-----	1	92	24	61	-----
New Bedford.....	12	309	182	127	-----	155	7,668	1,823	353	71
Northampton.....	11	26	26	-----	-----	21	308	216	463	-----
North Grafton.....	12	8	8	-----	-----	35	548	-----	38	-----
Pittsfield.....	12	10	4	6	-----	9	250	71	29	53
Pocasset.....	8	14	14	-----	-----	5	80	56	41	1
Quincy.....	6	2	1	1	-----	-----	133	51	18	3
Rutland.....	12	8	8	-----	-----	7	57	38	426	-----
Salem.....	12	64	41	23	-----	37	1,159	790	271	131
Springfield.....	12	140	81	56	3	22	3,726	1,289	381	104
Taunton.....	12	36	36	-----	-----	32	1,228	1,136	726	3
Tewkesbury.....	12	233	152	81	-----	127	6,348	287	2,154	454
Westborough.....	12	35	35	-----	-----	13	885	820	488	183
Worcester (3).....	32	204	121	83	-----	38	3,646	1,880	1,114	270

TABLE 4.—*Report of clinics, including those operating under the joint control of the United States Public Health Service and State boards of health, July 1, 1923, to June 30, 1924—Continued.*

State and city	Total monthly reports received	Patients admitted				Patients discharged as non-infectious	Treatments given	Doses of arsenphenamin administered	Wassermann tests made	Microscopic examinations, gonococcus
		Total	Syphilis	Gonorrhea	Chancroid					
Michigan.....	184	7,288	4,102	3,132	54	1,398	134,032	24,440	27,706	24,414
Ann Arbor.....	1	65	65	-----	-----	43	388	375	249	-----
Battle Creek.....	12	126	82	44	-----	97	1,876	914	264	160
Bay City.....	5	6	2	4	-----	1	-----	-----	6	6
Detroit (4).....	37	5,517	3,062	2,446	9	520	107,909	16,575	21,035	21,768
Escanaba.....	12	93	13	74	6	101	3,513	459	21	-----
Flint.....	12	548	411	136	1	33	8,138	2,441	3,408	711
Grand Rapids (2).....	23	261	92	162	7	282	1,979	945	437	329
Jackson.....	12	264	184	65	15	20	3,514	1,464	1,318	336
Kalamazoo.....	12	81	34	43	4	51	1,433	233	159	155
Lansing.....	12	102	48	54	-----	138	947	333	323	223
Marquette.....	10	2	2	-----	-----	1	21	18	12	16
Muskegon.....	12	92	24	57	11	65	2,282	177	117	181
Pontiac.....	10	78	50	27	1	8	648	218	142	231
Port Huron.....	2	5	5	-----	-----	2	25	25	8	1
Saginaw.....	12	48	28	20	-----	36	1,359	263	207	297
Minnesota.....	49	883	389	493	1	637	25,819	6,095	2,435	1,702
Duluth.....	12	427	146	280	1	64	9,610	1,294	588	899
Minneapolis (2).....	24	330	155	175	-----	191	9,513	2,404	672	212
St. Paul.....	12	122	86	36	-----	378	6,644	2,381	1,168	583
South St. Paul.....	1	4	2	2	-----	4	52	16	7	8
Mississippi.....	30	1,257	882	368	7	992	9,173	4,152	951	1,143
Hattiesburg.....	6	106	64	42	-----	35	2,868	575	557	324
Laurel.....	12	847	598	243	6	827	2,853	1,220	6	657
Meridian.....	12	304	220	83	1	130	3,452	2,357	388	162
Missouri.....	154	2,140	1,373	758	9	432	28,598	9,622	4,002	1,709
Columbia.....	9	2	2	-----	-----	1	10	3	18	-----
Flat River.....	11	36	20	16	-----	2	561	307	100	67
Hannibal.....	8	15	3	12	-----	6	156	9	1	1
Joplin.....	8	59	29	27	3	66	1,067	316	172	171
Kansas City (6).....	58	1,352	993	356	3	45	17,908	6,933	2,846	868
Sedalia.....	12	108	44	63	1	126	1,424	547	160	81
Springfield.....	12	252	123	128	1	167	3,383	813	200	119
St. Joseph.....	12	263	128	135	-----	17	2,685	573	278	106
St. Louis (2).....	24	53	31	21	1	2	1,404	121	227	296
Montana.....	23	38	18	19	1	23	255	191	27	67
Billings.....	11	19	8	10	1	13	130	92	19	24
Great Falls.....	12	19	10	9	-----	10	125	99	8	43
Nebraska.....	60	1,131	533	545	53	381	27,595	5,160	2,978	4,300
Hastings.....	12	27	10	17	-----	10	737	109	31	249
Lincoln.....	12	266	119	145	2	113	8,803	2,228	833	2,784
Omaha (2).....	24	825	396	379	50	246	17,249	2,577	2,068	1,249
Winnebago.....	12	13	8	4	1	12	806	246	46	18
New Hampshire.....	48	168	73	95	-----	25	7,978	1,617	462	279
Concord.....	12	26	13	13	-----	3	302	283	46	13
Dover.....	12	9	5	4	-----	-----	213	64	10	6
Manchester.....	12	92	34	58	-----	19	6,521	763	203	217
Nashua.....	12	41	21	20	-----	3	942	507	203	43
New Jersey.....	222	2,092	1,222	847	23	873	51,949	12,932	6,264	3,772
Atlantic City.....	12	237	148	89	-----	89	3,073	1,966	541	1,107
Bayonne.....	11	40	33	6	1	9	351	244	75	26
Camden.....	3	86	35	48	3	35	1,289	397	431	66
Elizabeth.....	6	21	18	3	-----	-----	479	241	36	33
Greystone Park.....	12	25	22	3	-----	19	547	494	171	3
Jersey City.....	12	64	29	35	-----	-----	717	350	62	80
Long Branch.....	12	79	72	7	-----	29	1,331	368	406	39
Montclair.....	12	41	41	-----	-----	3	1,043	852	230	14
Morristown.....	12	32	17	15	-----	8	354	107	88	32

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State and city	Total monthly reports received	Patients admitted				Patients discharged as non-infectious	Treatments given	Doses of arsenphenamin administered	Wassermann tests made	Microscopic examinations, gonococcus
		Total	Syphilis	Gonorrhea	Chancroid					
<b>New Jersey—Contd.</b>										
Mount Holly	8	12	12			2	69	54	35	11
Newark	12	730	338	385	7	503	23,891	2,768	1,749	1,551
New Brunswick	11	57	31	24	2	25	1,244	446	166	130
Orange	12	136	88	47	1	17	3,800	1,274	1,111	406
Passaic	12	31	24	7		5	770	317	111	12
Paterson (2)	24	96	66	27	3	10	2,546	955	234	
Plainfield	12	104	85	18	1	63	2,194	749	201	17
Salem	3	6	6				99	50	1	
Spring Lake	12	20	19	1		3	324	249	55	3
Trenton	12	253	129	119	5	45	7,089	969	534	219
Weehawken	12	22	9	13		8	739	82	27	23
<b>New Mexico</b>	15	29	15	14		31	623	239	116	41
Albuquerque	12	27	13	14		29	601	225	115	41
Raton	3	2	2			2	22	14	1	
<b>New York</b>	494	4,635	2,787	1,688	160	3,935	113,625	32,302	10,549	5,664
Albany (4)	43	413	228	163	22	204	5,917	1,702	524	117
Amsterdam	12	56	21	27	8	16	889	251	56	31
Auburn	12	18	18			13	568	129	130	
Beacon	9					5	17	17	13	
Binghamton	12	71	55	16		73	3,368	1,103	287	17
Buffalo	12	1,119	756	262	101	1,048	29,815	4,953	2,077	2,869
Coboes	12	34	11	19	4	33	515	136	13	2
Corning	12	15	11	4		4	666	293	14	
Dunkirk	12	15	11	4		8	274	57	32	2
Elmira	11	120	71	49		116	2,839	981	178	62
Glen Falls	12	55	26	29		40	2,208	565	135	60
Gloversville	12	53	39	14		34	841	561	38	48
Hornell	12	23	18	5		100	971	314	118	13
Ithaca	12	169	64	105		186	2,395	611	111	572
Jamestown	12	59	22	36	1	78	1,366	436	154	69
Little Falls	10	10	10			5	190	95	22	
Middletown	11	51	51			50	2,095	503	6	
Newburgh	12	11	9	1	1	1	248	56	20	4
New Rochelle	12	88	53	35		109	1,706	480	163	127
Niagara Falls	12	137	96	30	11	209	2,797	1,041	345	113
Olean	11	63	63			43	695	223	48	1
Oswego	12	16	13	3		9	1,262	455	19	1
Plattsburg	12	6	5	1		28	316	96	48	5
Port Chester	12	48	31	17		26	1,251	379	110	8
Poughkeepsie	12	46	34	12		79	1,380	428	139	116
Rochester (5)	54	600	432	168		441	23,695	10,818	3,162	544
Rome	12	66	32	34		40	1,259	404	138	38
Saratoga	11	18	17	1		20	207	100	23	1
Schenectady	12	192	81	109	2	77	2,459	493	148	117
Syracuse (2)	24	528	229	299		364	8,326	1,805	1,222	329
Troy	12	84	45	39		110	1,693	576	215	62
Utica	12	222	99	123		174	5,834	947	348	129
Watertown	11	6	6				45	10		
White Plains	11	34	33	1		50	358	269	85	1
Yonkers	12	189	97	82	10	142	5,160	1,016	408	206
<b>North Carolina</b>	73	2,505	1,622	792	91	1,159	12,721	8,698	3,301	415
Asheville	12	443	196	187	60	308	2,713	977	361	61
Charlotte	12	597	217	379	1	6	3,382	2,662	1,308	219
Fayetteville	9	106	91	13	2	133	632	606	137	32
New Bern	4	43	43			5	218	218	1	
Raleigh	12	178	166	11	1	125	1,086	585	439	
Wilmington	12	441	325	108	8	236	1,718	1,493	758	33
Winston-Salem	12	697	584	94	19	346	2,972	2,157	297	70
<b>North Dakota</b>	24	48	18	30		18	583	192	59	178
Grand Forks	12	14	3	11		11	187	63	19	12
Minot	12	34	15	19		7	396	129	40	166

TABLE 4.—*Report of clinics, including those operating under the joint control of the United States Public Health Service and State boards of health, July 1, 1923, to June 30, 1924—Continued*

State and city	Total month- ly reports re- ceived	Patients admitted				Pa- tients dis- charged as non- infectious	Treat- ments given	Doses of ar- sphen- amin admin- istered	Was- ser- mann tests made	Micro- scopic exami- nations, gon- ococcus
		Total	Syph- ilis	Gono- rhea	Chan- roid					
Ohio.....	399	9,138	4,764	3,989	385	3,716	196,086	31,108	25,362	24,873
Akron.....	11	872	290	471	111	448	25,927	2,808	1,679	1,985
Athens.....	12	42	39	3		3	1,382	274	262	4
Canton.....	12	40	40			6	703	248	143	4
Chillicothe.....	12	11	11			7	75	75	10	
Cincinnati (3).....	26	1,483	888	535	60	98	25,696	4,261	3,097	349
Cleveland (8).....	90	4,287	1,967	2,171	149	2,273	96,033	10,342	11,385	12,906
Columbus (5).....	49	539	397	141	1	305	9,995	3,124	3,328	1,105
Dayton (3).....	35	438	357	81		110	7,116	4,059	1,717	212
East Liverpool.....	12	215	43	148	24	146	2,947	573	164	273
Hamilton (2).....	16	51	49	2		17	318	246	76	27
Lakewood.....	10	4	4				24	24	19	
Lima (2).....	21	41	30	11		8	1,612	444	154	24
Massillon.....	11	88	88				4,900	954	465	21
Portsmouth.....	12	108	56	43	9	103	1,426	437	80	18
Port Clinton.....	12	4	3	1		1	24	13	91	3
Springfield (2).....	24	185	102	81	2	119	1,506	495	212	288
Toledo.....	12	562	243	290	29	61	14,435	1,714	1,828	7,633
Youngstown (2).....	22	168	157	11		11	1,967	1,017	652	21
Oklahoma.....	42	1,360	825	507	28	555	30,410	6,031	1,545	1,033
Chickasha.....	10	260	111	125	24	274	4,385	518	302	308
Enid.....	7	116	59	54	3	48	4,173	880	88	85
Oklahoma City (2).....	18	822	551	270	1	80	16,792	3,677	1,040	618
Tulsa.....	7	162	104	58		153	5,060	956	115	22
Oregon:										
Portland.....	12	455	267	188		33	7,291	2,974	966	1,032
Pennsylvania.....	494	4,487	2,364	1,993	130	3,870	72,033	21,098	11,248	4,343
Allentown.....	12	316	234	82		257	5,541	2,596	1,096	316
Altoona.....	12	132	53	79		109	1,870	341	93	132
Beaver Falls.....	10	14	10	4		2	185	75	70	14
Bethlehem.....	12	140	132	8		57	1,550	809	313	140
Butler.....	11	39	12	24	3	38	655	103	86	36
Carlisle.....	11	48	36	12			552	250	75	47
Chambersburg.....	12	35	23	12		1	427	142	73	35
Clearfield.....	6	6	6				58	5	17	6
Coatesville.....	12	51	40	11		25	417	170	96	51
Connellsville.....	4	18	13	5		1	151	53	42	18
Du Bois.....	10	47	36	11		62	948	510	301	47
Easton.....	12	45	29	16		54	921	206	176	45
Erie.....	12	285	132	153		276	4,104	1,385	721	285
Greensburg.....	9	47	34	12	1	201	1,071	221	313	46
Hazleton.....	11	44	19	23	2	34	905	84	150	42
Johnstown.....	12	144	66	75	3	124	1,359	556	250	141
Lancaster (2).....	24	85	52	33		46	932	214	347	85
Lebanon.....	11	36	30	6		13	277	114	36	36
McKeesport.....	12	80	48	32		63	2,046	439	182	78
Mifflintown.....	12	14	1	11	2	2	124	21	16	12
Monessen.....	12	38	28	8	2		339	125	116	36
Monongahela.....	6	7	6		1	1	125	27	7	6
New Castle.....	12	44	41	3		24	404	172	98	44
New Kensington.....	12	43	24	18	1	10	749	367	180	42
Norristown.....	12	20	17	3		14	260	122	71	20
Philadelphia.....	12	394	182	195	17	565	10,296	2,601	1,205	377
Philipsburg.....	5	7	7			10	29	15	14	
Pittsburgh.....	12	595	316	261	18	687	7,564	2,397	854	577
Pittston.....	5	7	7				45		8	3
Pottsville.....	12	43	32	11		27	467	432	66	43
Punxsutawney.....	3	8	5	3		10	144	39	66	8
Reading.....	11	315	123	186	6	194	5,012	131	314	309
Rochester.....	12	29	28	1			232	180	33	29
Scranton.....	12	290	104	160	26	138	4,408	1,081	873	264
Shamokin.....	12	59	16	42	1	68	974	138	64	58
Sharon.....	11	22	18	2	2	7	217	161	38	20
Stroudsburg.....	12	44	9	35		40	539	157	62	44
Sunbury.....	12	68	40	28		29	1,710	343	136	68
Tunkhannock.....	12	13	7	6		3	111	43	12	13
Washington.....	12	115	55	55	5	99	1,651	386	227	110

TABLE 4.—*Report of clinics, including those operating under the joint control of the United States Public Health Service and State boards of health, July 1, 1923, to June 30, 1924—Continued*

State and city	Total month- ly reports re- ceived	Patients admitted				Pa- tients dis- charged as non- infec- tious	Treat- ments given	Doses of ar- sphen- amin admin- istered	Was- ser- mann tests made	Micro- scopic exam- ina- tions, gon- ococ- cus
		Total	Syph- ilis	Gono- rhea	Chan- roid					
Pennsylvania—Contd.										
West Chester.....	12	51	24	27	-----	-----	448	133	201	51
West Grove.....	2	2	2	-----	-----	-----	4	3	-----	2
Wilkes-Barre (2).....	24	438	148	254	36	428	10,097	3,337	1,855	403
Williamsport.....	8	38	27	9	2	-----	401	294	81	35
York.....	12	171	92	77	2	145	1,714	120	214	169
Rhode Island.....	69	619	354	259	6	164	12,233	5,134	5,355	2,198
Arctic.....	2	-----	-----	-----	-----	-----	-----	-----	-----	-----
Newport.....	11	24	21	3	-----	13	308	279	50	10
Pawtucket.....	12	57	36	21	-----	10	2,108	506	131	23
Providence (3).....	36	532	291	235	6	141	9,700	4,268	5,147	2,150
Woonsocket.....	8	6	6	-----	-----	-----	117	81	27	15
South Carolina.....	36	2,173	1,061	1,057	55	1,024	32,901	8,314	2,006	6,536
Greenville.....	12	241	177	58	6	262	5,812	2,734	836	107
Orangeburg.....	12	366	260	105	1	200	2,715	1,234	643	-----
Spartanburg.....	12	1,566	624	894	48	562	24,374	4,346	527	6,429
South Dakota.....	24	55	27	27	1	37	868	287	131	123
Aberdeen.....	12	16	9	6	1	1	306	50	93	40
Sioux Falls.....	12	39	18	21	-----	36	562	237	38	83
Tennessee.....	60	5,071	3,116	1,529	426	2,381	86,029	18,279	20,352	7,382
Chattanooga.....	12	715	437	246	32	183	20,943	3,566	622	1,722
Knoxville.....	12	882	424	393	65	419	21,262	3,164	1,563	2,125
Memphis.....	12	1,836	1,536	251	49	846	22,893	8,418	15,757	1,589
Nashville (2).....	24	1,638	719	639	280	933	20,931	3,131	2,410	1,946
Texas.....	60	4,314	1,960	1,866	488	2,929	65,599	16,014	7,901	11,617
Corpus Christi.....	9	246	47	159	40	192	1,453	169	1,324	1,532
Dallas.....	10	635	209	401	25	488	18,868	1,837	895	747
El Paso.....	9	392	207	156	29	177	11,194	1,172	695	694
Fort Worth.....	2	43	32	9	2	4	278	278	74	20
Galveston.....	9	593	180	251	162	415	5,415	3,867	710	595
Houston.....	10	1,733	925	611	197	1,318	17,232	5,938	3,090	2,914
San Antonio.....	11	672	360	279	33	335	11,159	2,753	1,113	5,115
Utah:										
Salt Lake City.....	2	79	25	52	2	12	588	127	105	115
Vermont.....	48	116	80	36	-----	75	2,355	1,204	246	25
Barre.....	12	14	12	2	-----	10	222	97	49	1
Burlington (2).....	24	87	53	34	-----	24	1,597	729	87	9
Rutland.....	12	15	15	-----	-----	41	536	378	110	15
Virginia.....	115	2,980	1,894	1,025	61	1,342	46,681	14,437	10,773	4,201
Alexandria.....	8	138	58	78	2	104	4,087	910	386	293
Charlottesville.....	12	341	261	77	3	268	4,524	1,664	4,152	188
Danville.....	12	96	51	44	1	24	610	290	179	66
Lynchburg.....	12	216	64	118	34	151	2,303	528	164	304
Newport News.....	12	143	99	40	4	177	14,934	2,360	1,068	876
Norfolk.....	12	400	314	85	1	299	5,508	2,108	1,121	711
Norton.....	11	202	131	68	3	209	3,065	924	398	39
Petersburg.....	12	440	339	100	1	48	4,376	2,779	941	181
Richmond.....	12	857	501	347	9	41	5,902	2,289	2,243	1,539
Roanoke.....	12	147	76	68	3	21	1,372	585	91	4
Washington.....	33	1,197	528	664	5	932	23,227	4,410	7,510	4,298
Seattle.....	12	782	364	414	4	603	11,674	3,264	6,234	2,187
Spokane.....	12	335	129	205	1	288	10,932	953	1,208	1,804
Tacoma.....	9	80	35	45	-----	41	621	193	68	307

TABLE 4.—*Report of clinics, including those operating under the joint control of the United States Public Health Service and State boards of health, July 1, 1923, to June 30, 1924—Continued*

State and city	Total monthly reports received	Patients admitted				Patients discharged as non-infectious	Treatments given	Doses of arsphenamin administered	Wassermann tests made	Microscopic examinations, gonococcus
		Total	Syphilis	Gonorrhea	Chancroid					
West Virginia.....	117	1,432	782	603	47	572	14,626	5,100	2,116	1,727
Beckley.....	5	43	32	9	2	14	226	190	292	29
Bluefield.....	8	27	15	11	1	15	408	115	31	75
Charleston.....	12	443	215	223	5	125	3,509	831	709	516
Clarksburg.....	12	101	81	19	1	157	1,822	1,000	146	148
Elkins.....	8	55	16	38	1	19	283	23	39	238
Hinton.....	3	7	3	4	—	1	45	7	1	3
Huntington.....	12	269	144	99	26	75	4,273	1,127	341	366
Logan.....	6	20	20	—	—	—	20	20	6	—
Martinsburg.....	5	8	7	1	—	2	30	26	5	—
Morgantown.....	6	42	19	19	4	31	337	116	76	120
Oak Hill.....	4	34	12	22	—	13	74	32	25	10
Point Pleasant.....	5	7	6	—	1	2	36	18	3	—
Richwood.....	12	17	17	—	—	24	195	185	12	—
Wheeling.....	12	150	106	38	6	5	2,574	1,206	395	198
Williamson.....	7	209	89	120	—	89	794	204	35	24
Wisconsin.....	156	1,312	683	619	10	280	13,339	5,422	8,933	5,512
Beloit.....	12	35	17	18	—	18	558	260	—	—
Green Bay.....	12	18	7	11	—	3	53	28	17	6
Janesville.....	12	29	10	18	1	12	696	92	107	55
Kenosha.....	12	32	21	11	—	15	263	106	251	153
La Crosse.....	12	53	16	37	—	24	877	172	320	290
Madison.....	12	80	28	52	—	14	604	210	195	121
Milwaukee (3).....	36	903	530	368	5	129	7,410	4,118	7,456	4,098
Oshkosh.....	12	22	11	8	3	3	434	73	68	40
Racine.....	12	36	18	18	—	16	466	110	249	245
Superior.....	12	42	19	22	1	7	1,365	217	197	303
Wausau.....	12	62	6	56	—	39	613	36	73	201
Wyoming: Casper.....	5	47	32	15	—	16	623	268	336	352

TABLE 5.—*States ranked according to the monthly and daily admissions per clinic, July 1, 1923, to June 30, 1924*

Rank	State	Monthly average new admissions per clinic	Daily average new admissions per clinic	Rank	State	Monthly average new admissions per clinic	Daily average new admissions per clinic
	United States.....	21.9	0.7	23	Minnesota.....	18.0	0.6
1	Tennessee.....	84.5	2.8	24	Indiana.....	16.2	.5
2	Louisiana.....	78.3	2.6	25	Missouri.....	13.9	.5
3	Texas.....	71.9	2.4	26	Massachusetts.....	13.6	.5
4	District of Columbia.....	69.7	2.3	27	Iowa.....	12.4	.4
5	South Carolina.....	60.4	2.0	28	West Virginia.....	12.2	.4
6	Alabama.....	51.3	1.7	29	Connecticut.....	12.1	.4
7	California.....	50.4	1.7	30	Florida.....	11.3	.4
8	Mississippi.....	41.9	1.4	31	Colorado.....	9.7	.3
9	Michigan.....	39.6	1.3	32	New Jersey.....	9.4	.3
10	Utah.....	39.5	1.3	33	New York.....	9.4	.3
11	Georgia.....	39.3	1.3	34	Wyoming.....	9.4	.3
12	Oregon.....	37.9	1.3	35	Pennsylvania.....	9.1	.3
13	Illinois.....	36.3	1.2	36	Rhode Island.....	9.0	.3
14	Washington.....	36.3	1.2	37	Kansas.....	8.7	.3
15	North Carolina.....	34.3	1.1	38	Wisconsin.....	8.4	.3
16	Oklahoma.....	32.4	1.1	39	Maine.....	6.9	.2
17	Arkansas.....	32.1	1.1	40	Delaware.....	6.7	.2
18	Kentucky.....	27.7	.9	41	New Hampshire.....	3.5	.1
19	Virginia.....	25.9	.9	42	Vermont.....	2.4	.1
20	Ohio.....	22.9	.8	43	South Dakota.....	2.3	.1
21	Maryland.....	19.5	.6	44	North Dakota.....	2.0	.1
22	Nebraska.....	18.9	.6	45	New Mexico.....	1.9	.1
				46	Montana.....	1.7	.1



TABLE 6.—*Report of 37 correctional and penal insritutions*

Patients admitted:	
Syphilis.....	4, 029
Gonorrhea.....	2, 884
Chancroid.....	132
Total.....	7, 045
Patients discharged as noninfectious.....	4, 718
Treatments given.....	229, 572
Doses of arsphenamin (or similar product) administered.....	24, 286
Wassermann tests made.....	34, 344
Microscopic examination for gonococcus infection.....	9, 407

TABLE 7.—*State report of doses of arsphenamin (or similar product) administered, July 1, 1923, to June 30, 1924*

State	Doses distributed	State	Doses distributed
United States.....	604, 128	Montana.....	377
Alabama.....	38, 147	Nebraska.....	6, 568
Arizona.....	1, 780	Nevada <sup>1</sup> .....	—
Arkansas.....	12, 162	New Hampshire.....	1, 680
California.....	34, 493	New Jersey.....	13, 728
Colorado.....	3, 782	New Mexico.....	250
Connecticut.....	12, 294	New York.....	31, 216
Delaware.....	812	North Carolina.....	14, 952
District of Columbia.....	3, 547	North Dakota.....	196
Florida.....	3, 267	Ohio.....	36, 820
Georgia.....	22, 354	Oklahoma.....	7, 815
Idaho.....	860	Oregon.....	3, 064
Illinois.....	45, 335	Pennsylvania.....	25, 939
Indiana.....	19, 088	Rhode Island.....	5, 201
Iowa.....	6, 928	South Carolina.....	9, 017
Kansas.....	8, 907	South Dakota.....	287
Kentucky.....	17, 542	Tennessee.....	18, 279
Louisiana.....	23, 725	Texas <sup>2</sup> .....	16, 109
Maine.....	2, 608	Utah <sup>3</sup> .....	127
Maryland.....	12, 012	Vermont.....	1, 384
Massachusetts.....	50, 847	Virginia.....	15, 292
Michigan.....	24, 514	Washington.....	4, 445
Minnesota.....	6, 095	West Virginia.....	6, 222
Mississippi.....	17, 387	Wisconsin.....	5, 822
Missouri.....	10, 584	Wyoming <sup>4</sup> .....	268

<sup>1</sup> Not reporting.<sup>2</sup> For 11 months only.<sup>3</sup> From clinic reports; for two months only.<sup>4</sup> From clinic reports; for five months only.

TABLE 8.—*Educational pamphlets and placards purchased and reprinted by State boards of health, July 1, 1923, to June 30, 1924*

State	Total	A	B	C	D	E	F	Others	Pla- cards
United States.....	967,452	116,000	265,975	115,000	181,000	132,500	32,600	123,005	1,372
Alabama.....	31,000	5,000	5,000	5,000	5,000	5,000		6,000	
Arizona.....	11,000			3,000	4,000	4,000			
Arkansas.....	15,000			10,000	5,000				
California.....									
Colorado.....	5,240							5,000	240
Connecticut.....									
Delaware.....									
District of Columbia.....	13,000	3,000	6,000		2,000	2,000			
Florida.....	17,000	3,000		3,000		12,000			
Georgia.....	20,000	10,000			10,000				
Idaho.....									
Illinois.....	65,000	10,000	10,000	5,000	25,000	15,000			
Indiana.....	10,000		10,000						
Iowa.....	5,000				5,000				
Kansas.....	17,000		3,000	6,000	5,000	3,000			
Kentucky.....	20,000	5,000		5,000	5,000	5,000			
Louisiana.....	650		650						
Maine.....	29,300		5,000		16,000	5,000	3,100	200	
Maryland.....	3,084				3,000				84
Massachusetts.....	44,000	10,000	3,000	10,000	14,000	5,000	2,000		
Michigan.....	50,000	10,000		10,000	10,000		10,000		
Minnesota.....	16,048	2,000	3,000			10,000	1,000		48
Mississippi.....	247,680		150,000	10,000		10,000		76,680	1,000
Missouri.....									
Montana.....									
Nebraska.....	50,000		10,000	10,000	20,000	10,000			
Nevada <sup>1</sup> .....									
New Hampshire.....	25,000	5,000	10,000	5,000	5,000				
New Jersey.....	42,600	10,000	10,100	5,000	9,000	5,000		3,500	
New Mexico.....	3,375		350	3,000				25	
New York.....	31,100	20,000						11,100	
North Carolina.....									
North Dakota.....	11,000		1,000					10,000	
Ohio.....									
Oklahoma.....									
Oregon.....									
Pennsylvania.....	11,000	2,000		5,000	2,000	2,000			
Rhode Island.....	25,800	2,000	8,800	2,000	8,000	3,000	2,000		
South Carolina.....	1,000			1,000					
South Dakota.....									
Tennessee.....									
Texas.....									
Utah <sup>2</sup> .....									
Vermont.....	500				500				
Virginia.....	57,800	12,000		13,000	3,500	14,500	14,500	300	
Washington.....									
West Virginia.....	54,275	8,000	30,075	4,000	4,000	8,000		200	
Wisconsin.....	34,000				20,000	4,000		10,000	
Wyoming.....									

<sup>1</sup> Includes 7,000 pamphlets purchased by the Social Hygiene Society of the District of Columbia for the use of the District of Columbia health department.

<sup>2</sup> Not reporting.

TABLE 9.—*Exhibits, lantern-slide sets, and motion-picture films borrowed or purchased by State boards of health, July 1, 1923, to June 30, 1924*

State	Ex- hibits	Slides	Films	State	Ex- hibits	Slides	Films
United States.....	309	10	47	Iowa.....	71	1	6
Alabama.....	24			Kansas.....	5		
Arizona.....		1	1	Kentucky.....			
Arkansas.....				Louisiana.....	5		
California.....				Maine.....			1
Colorado.....				Maryland.....			
Connecticut.....				Massachusetts.....	20		8
Delaware.....	1		1	Michigan.....			
District of Columbia.....			1 2	Minnesota.....			
Florida.....			5	Mississippi.....	15		
Georgia.....	10			Missouri.....			
Idaho.....				Montana.....			
Illinois.....				Nebraska.....			
Indiana.....				Nevada <sup>2</sup> .....			
				New Hampshire.....			

<sup>1</sup> Includes one film made in the District of Columbia for local work.

<sup>2</sup> Not reporting.

TABLE 9.—*Exhibits, lantern-slide sets, and motion-picture films borrowed or purchased by State boards of health, July 1, 1923, to June 30, 1924—Continued*

State	Ex-hibits	Slides	Films	State	Ex-hibits	Slides	Films
New Jersey.....	15			South Dakota.....			
New Mexico.....			12	Tennessee.....	16		6
New York.....		4		Texas.....			
North Carolina.....				Utah.....			
North Dakota.....				Vermont.....			
Ohio.....				Virginia.....	34		1
Oklahoma.....	74			Washington.....			
Oregon.....				West Virginia.....	1	4	4
Pennsylvania.....				Wisconsin.....	12		
Rhode Island.....				Wyoming.....			
South Carolina.....	6						

<sup>2</sup> Not reporting.<sup>3</sup> Stereomotorgraph.TABLE 10.—*State report of educational activities, July 1, 1923, to June 30, 1924*

State	Pamphlets distributed	Lectures			Film showings		Exhibit and slide showings	
		Number	Average attendance	Exhibit material used	Number	Average attendance	Number	Average attendance
United States.....	1, 171, 628	5, 246	115	486	1, 266	354	996	487
Alabama.....	32, 063	162	120		34	239	10	29
Arizona.....	7, 482							
Arkansas.....	39, 499	109	135		20	301	379	85
California.....	30, 566	5	642		80	269	5	200
Colorado.....	7, 843	3	122		6	71	16	35
Connecticut.....	3, 229	5	52					
Delaware.....	200	8	161	3			1	50
District of Columbia.....	6, 250	54	72	44	4	450	21	400
Florida.....	20, 156	30	369		14	542	1	(1)
Georgia.....	7, 667	174	104		66	240	4	68
Idaho.....	1, 272							
Illinois.....	178, 248	217	303	9	550	553	174	1, 322
Indiana.....	55, 091	121	104	53	2	350	6	275
Iowa.....	16, 668	367	138		52	247	12	337
Kansas.....	25, 367	145	130	24	19	243	14	148
Kentucky.....	23, 874	28	48					
Louisiana.....	11, 368	5	96	3	13	156		
Maine.....	1, 796	205	112					
Maryland.....	964	1	65	1			1	(2)
Massachusetts.....	35, 739	107	110	49	1	3	7	143
Michigan.....	31, 362	180	131	11	4	118	16	14
Minnesota.....	22, 970	51	59	7			8	(3)
Mississippi.....	86, 811	353	119	26	1	225		
Missouri.....	10, 267				4	230	3	106
Montana.....	14, 587	44	150		7	120	15	88
Nebraska.....	74, 452	8	69					
Nevada.....								
New Hampshire.....	2, 066	21	67		2	50	2	(4)
New Jersey.....	51, 858	303	136	17				
New Mexico.....	1, 226	1	10					
New York.....	78, 793	331	81	2	5	79	1	3, 100
North Carolina.....								
North Dakota.....	7, 113	34	122		9	134		
Ohio.....								
Oklahoma.....	18, 871	15	250				42	167
Oregon.....	12, 492	434	47		169	66		
Pennsylvania.....	14, 806	204	276		9	179	15	100
Rhode Island.....	15, 052	20	329	2	10	610	38	53
South Carolina.....	845						(5)	
South Dakota.....	6, 912	165	139	121			24	5, 854
Tennessee.....	40, 589	15	85	3	6	231		
Texas.....	7 16, 815							
Utah.....								
Vermont.....	60							
Virginia.....	40, 048	205	129	78	57	260	15	(5)
Washington.....	2, 774							
West Virginia.....	35, 018	99	80	33	57	210	152	106
Wisconsin.....	80, 490	1, 017	50		65	166	14	124
Wyoming.....								

<sup>1</sup> Permanent exhibit in smoking room of Jacksonville terminal station, seen by thousands daily.<sup>2</sup> Permanent exhibit; seen by all persons attending clinic.<sup>3</sup> At Minnesota State Fair. Impossible to estimate number of persons who saw exhibit.<sup>4</sup> Not reporting.<sup>5</sup> Information not available.<sup>6</sup> Attract-O-Scope exhibit of "Keeping Fit" shown at State fair; seen by about 75,000 persons.<sup>7</sup> For 11 months only.

TABLE 11.—Statistical summary of activities in the control of venereal diseases, for the fiscal years 1923 and 1924

	1924	1923
<i>Medical activities</i>		
A. Cases of venereal diseases reported to State boards of health:		
I. Syphilis	193,844	172,258
II. Gonorrhea	160,790	156,826
III. Chancroid	8,429	1,140
Total	363,063	330,224
B. Doses of arsenphenamin (or similar product distributed by State boards of health)	604,128	583,772
C. Clinics:		
I. Clinics established during the year	44	33
II. Clinics reporting to State boards of health	504	513
III. Reports from clinics:		
a. Patients admitted	118,023	119,217
b. Patients discharged as noninfectious	51,658	55,503
c. Treatments given	2,147,087	1,992,631
d. Wassermann tests made	302,152	274,957
e. Microscopic examinations for gonococcus infection	203,008	191,132
D. Requests for medical information received by the Public Health Service	694	668
<i>Educational activities</i>		
A. Pamphlets:		
I. Requests for pamphlets received by the		
a. Public Health Service	13,453	14,383
b. State boards of health from—		
1. Public Health Service for compliance	8,309	10,896
2. The public	28,322	41,877
Total	36,631	52,773
c. Gross total requests for pamphlets received	50,084	66,666
Minus requests received by State boards of health from the Public Health Service	8,309	10,896
d. Net total requests for pamphlets received	41,775	55,770
II. Pamphlets distributed—		
a. By the Public Health Service to		
1. State boards of health	7,372	26,887
2. Others	59,253	106,489
Total	66,625	133,376
b. By State boards of health	1,171,628	1,568,893
c. Gross total pamphlets distributed	1,238,253	1,702,272
Minus pamphlets distributed by the Public Health Service to State boards of health	7,372	26,887
d. Net total pamphlets distributed	1,230,881	1,675,385
III. Pamphlets and placards purchased and reprinted by State boards of health	967,452	1,513,201
IV. Educational venereal-disease pamphlets issued by the Public Health Service	2	2
V. Revisions of venereal-disease pamphlets issued by the Public Health Service		
B. Lectures and addresses:		
I. Lectures and addresses reported by the		
a. Public Health Service	338	345
b. State boards of health	5,246	5,722
Total	5,584	6,067
II. Average attendance reported by the—		
a. Public Health Service	182	213
b. State boards of health	115	107
Average attendance at total lectures reported	119	122
III. Lectures at which exhibit material was used, reported by		
a. Public Health Service	44	216
b. State boards of health	486	566
Total	530	782

<sup>1</sup> Includes 1,820 cases not classified according to disease.

Information not available for 1923. "Keeping fit" shown at State Fair, shown by about 75,000 persons.

TABLE 11.—Statistical summary of activities in the control of venereal diseases, for the fiscal years 1923 and 1924—Continued

	1924	1923
C. Exhibits and lantern slides:		
I. Exhibits and lantern slide sets loaned by the Public Health Service to—		
a. State boards of health.....	293	15
b. Public Health Service field officers.....	37	97
c. Others.....	86	61
Total.....	416	173
II. Exhibits and lantern slide sets purchased and borrowed by—		
a. State boards of health.....	319	457
b. Others.....	34	404
Total.....	353	861
III. Exhibit and lantern slide showings reported by State boards of health..	996	1,843
IV. Average attendance reported by State boards of health.....	487	549
D. Motion-picture films:		
I. Motion-picture films loaned by the Public Health Service to—		
a. State boards of health.....	37	16
b. Public Health Service field officers.....	93	27
c. Others.....	20	16
Total.....	150	59
II. Motion-picture films purchased and borrowed by State boards of health.....	47	68
III. Motion-picture showings reported by—		
a. Public Health Service.....	226	174
b. State boards of health.....	266	492
Total.....	492	666
IV. Average attendance reported by—		
a. Public Health Service.....	331	215
b. State boards of health.....	834	1,000
Average attendance at total showings.....	834	1,000
E. Publicity material, Public Health Service:		
I. Articles furnished by the Service.....	3	3
II. Periodicals containing articles received.....	1	1
III. Circulation of articles published.....	1	1
IV. News sheets furnished journals.....	1	1
A. States receiving Federal funds.....	1	1
B. States enacting legislation for venereal disease control purposes.....	1	1
C. City ordinances for venereal disease control passed.....	1	1
D. Expenditure of appropriations made for venereal disease control purposes.....	1	1

On the date mentioned there were 656 officers in the various grades of the Public Health Service reserve serving with the Veterans' Bureau. Many of these officers had served faithfully and efficiently since the Public Health Service was directed by the act of Congress of March 3, 1919, to undertake the hospitalization of disabled veterans of the World War. Many of them rendered valuable assistance in the establishment of ways and means for caring for the increasing tide of wounded, sick, and disabled veterans which flowed back into civil life following the war. These officers generally rendered loyal, efficient service in the interest of ex-service men and women. Acknowledgment is due and here made to these officers for the meritorious services rendered by them.

## DIVISION OF PERSONNEL AND ACCOUNTS

In charge of Asst. Surg. Gen. J. W. KERR

The most notable change affecting the personnel of the service during the past fiscal year was that resulting from the passage of the act approved June 7, 1924, entitled, "An act to consolidate, codify, revise, and reenact the laws affecting the establishment of the United States Veterans' Bureau \* \* \*." This act in terms repealed the act which originally established the United States Veterans' Bureau, which latter act contained the following provision with respect to the detail of commissioned officers of the Public Health Service to the Veterans' Bureau for duty:

All commissioned personnel detailed or hereafter detailed from the United States Public Health Service to the Veterans' Bureau shall hold the same rank and grade, shall receive the same pay and allowances, and shall be subject to the same rules for relative rank and promotion as now or hereafter may be provided by law for commissioned personnel of the same rank or grade or performing the same or similar duties in the United States Public Health Service.

Inasmuch as the above provision is not contained in the act approved June 7, 1924, the President issued an Executive order under date of June 7, directing that such of the commissioned personnel of the Public Health Service as had been previously detailed to the Veterans' Bureau and as might be designated by the director should be appointed and employed in the Veterans' Bureau at such rates of compensation and for such time as the director might direct, without regard to the provisions of civil-service law and regulations.

The Public Health Service was subsequently requested by the director of the Veterans' Bureau to terminate all details of commissioned personnel to that bureau, effective at the close of business June 6, 1924, and was advised that all personnel so detailed had been appointed at salaries equal in amount to base pay, longevity, and allowances under their commissioned status. In accordance with this request, all commissioned officers who were then on detail with the Veterans' Bureau were placed on inactive status, effective June 6, 1924.

On the date mentioned there were 656 officers in the various grades of the Public Health Service reserve serving with the Veterans' Bureau. Many of these officers had served faithfully and efficiently since the Public Health Service was directed by the act of Congress of March 3, 1919, to undertake the hospitalization of disabled veterans of the World War. Many of them rendered valuable assistance in the establishment of ways and means for caring for the increasing tide of wounded, sick, and disabled veterans which flowed back into civil life following the war. These officers generally rendered loyal, efficient service in the interest of ex-service men and women. Acknowledgment is due and here made to these officers for the meritorious services rendered by them.

An act approved May 31, 1924, entitled, "An act to amend the act entitled 'An act to readjust the pay and allowances of the commissioned and enlisted personnel of the Army, Navy, Marine Corps, Coast Guard, Coast and Geodetic Survey, and Public Health Service,' approved June 10, 1922," will clarify certain provisions of the joint-service pay act, and will, it is believed, insure to officers of the services concerned certain rights with regard to the receipt of rental allowance heretofore disallowed by decisions of the Comptroller General. That section of the joint-service pay act providing for the payment of rental allowance has been amended, and the President is directed to make regulations in execution of the amended section in times of peace and war which shall "whenever practicable in his judgment, be uniform for all of the services concerned, including adjunct forces thereof." Regulations in accordance with the provisions of this section are in course of preparation.

During the latter part of the fiscal year 1923 detailed description sheets covering all positions in the field service were secured from the various field stations on instructions from the Personnel Classification Board. These sheets were later considered by a board of service officers and a classification of all field positions was recommended, together with rates of compensation.

Subsequently, new instructions were received from the Personnel Classification Board in its circular No. 13, dated November 13, 1923. In accordance with these instructions, all field personnel of the service, with the exception of commissioned officers, were reported upon according to a "tentative schedule of grades and rates for field-service positions" set forth in the circular.

Estimates of appropriations required to enable the heads of the several departments and independent establishments to adjust the rates of compensation of civilian employees in certain of the field services were submitted to Congress by the Budget and included in bill H. R. 9561. This bill failed of final passage at the last session of Congress.

The action of the President in authorizing an apportionment of appropriations available for the fiscal year 1925, so that amounts apportioned for the first two quarters of the year would enable the several branches of the Government service to pay rates of compensation in conformity with the provisions of bill H. R. 9561, brought relief in a situation which appeared serious in view of the fact that Congress had made no other provision for the continuation of the bonus after July 1, 1924. Following the President's action, recommendations were submitted to the Secretary of the Treasury carrying new rates of pay, including, in all cases, the amount formerly paid as bonus, and in certain cases increases to adjust, in so far as possible, the compensation of field employees to correspond as nearly as practicable, within the appropriations contemplated by bill H. R. 9561, to rates established by the classification act of 1923. These rates of pay became effective July 1. They are not equal, however, to the rates originally proposed on the basis of the classification sheets submitted from field stations in 1923.

In conformity with the requirement of the Director of the Budget, new standard forms of service record cards and personal-history statements were distributed at the close of the year for general use

throughout the service beginning July 1, 1924. New standard payroll vouchers were likewise distributed for use after the beginning of the fiscal year 1925. On account of the size of the blanks proposed, representations were made to the General Accounting Office, where the new forms were devised in order to secure a smaller form which would be practicable for use at small field stations.

### PUBLIC HEALTH DISTRICTS

The experience of the past year has served further to demonstrate the practical value of the establishment of district offices, with an experienced service officer in charge as director in each district. This plan, which was inaugurated during the fiscal year 1923, was described in the last annual report of the Surgeon General. The duties of the district directors, briefly stated, are as follows: To make inspections of service stations and activities; to study and report upon standardization of methods and facilities; to coordinate activities within their respective districts; to investigate and adjust controversies and serve on boards on instructions from the Surgeon General; to report on matters affecting service and public-health policies; to promote cordial relations with State and local and other public health organizations; and to carry out other instructions issued from the bureau from time to time. It has been understood from the first that the functions of the district directors were investigative and advisory in character, and did not include authority over the internal affairs of stations within their districts.

The geographical areas of the several districts were stated in the last annual report. These districts correspond generally to the provisional districts prescribed a number of years ago.

In district No. 1, Surg. A. J. McLaughlin served as director until March 12, 1924, on which date he was relieved from duty and succeeded temporarily by Senior Surg. E. K. Sprague. On April 21, 1924, these duties were assumed by Asst. Surg. Gen. Rupert Blue. In addition to his duties looking to the coordination of service activities within the district, Surgeon McLaughlin, prior to being relieved from duty, carried out surveys of the organization and activities of the health departments of Yonkers, Troy, Schenectady, Utica, and New York, N. Y., and Trenton, N. J.

The director of district No. 1 serves as coordinator for supply and coordinator for motor transportation in Greater New York City, and one of his assistants acts as special disbursing agent for the service in and around New York. During the past year, monthly contracts have been made for all classes of subsistence supplies, with quarterly contracts for certain other classes subject to less fluctuation in price. The advantage of placing all stations on the same contract has been manifest, both as to quality of supplies and with regard to cost figures. During the year the United States Veterans' Hospital No. 81 has obtained its supplies on contracts of this service.

Surg. B. S. Warren has continued as director of district No. 2 throughout the year, with headquarters at Baltimore, Md. During the year inspections have been made of all the stations and activities within the district. Rearrangements of service activities at the Baltimore quarantine and immigration station, the Cape Fear (N. C.) quarantine station, the Philadelphia quarantine and immigration



and relief stations. the marine hospital at Baltimore, the relief station at Wilmington, N. C., and at other places were recommended and effected. Conferences were held with contract physicians furnishing relief to men at Coast Guard stations. Conference was also held with United States Shipping Board officials and an inspection was made of the laid-up fleet at Lee Hall, Va. The district director also represented the service at meetings for the promotion of public health within his district, and during the year made surveys of the organization and activities of the health departments of Wilmington, Del., and Washington, D. C. Conferences were also held with state and local health authorities within the district. Recommendations for consolidation and rearrangements of service activities within this district during the past year and the year preceding have resulted in substantial economies.

Senior Surg. C. C. Pierce has served as district director in district No. 3 throughout the year, with headquarters at Chicago, Ill. During the year all marine hospitals in the district were inspected, as were also 11 relief stations, and 8 Coast Guard contract stations. Numerous conferences were held and investigations made on orders from the bureau, and the director served on 8 boards convened during the year. Meetings of 11 organizations, local and national, interested in public-health matters were attended; a series of addresses on public health was delivered to the medical students of the University of Indiana, and cooperation with the area coordinator and other Government officials was continued. From November 9 to 28, 1923, the director assumed temporary charge of the marine hospital at St. Louis, Mo. During the year conferences were held with the commissioner of health of Detroit, and health officials at Cleveland and Toledo, Ohio, Benton Harbor and St. Joseph, Mich., Michigan City, Ind., and Windsor, Ontario, regarding measures for the control of smallpox, which occurred in this territory. From February 28 to March 17, 1924, the director of this district was in charge of smallpox-quarantine measures on the St. Clair River, between Windsor, Canada, and Detroit, Mich. Several other visits were made to Detroit during the remainder of the fiscal year for the purpose of continuing cooperative smallpox-control work. Inspections were made of Federal buildings at Cornell, Wis., Jackson Park, Ill., and Chicago, Ill. Surveys were made of the health organizations of Peoria, Ill., Oklahoma City and Tulsa, Okla.

In district No. 4 Asst. Surg. Gen. L. L. Williams served as director with headquarters at New Orleans, La., until October 30, 1923, at which time he was placed on "waiting orders" on account of disability, after 38 years of service. Surg. H. F. White served as acting director for a temporary period following the retirement of Dr. L. L. Williams, and duties usually discharged by the director have recently been performed by details of other officers as needed at various places in the district.

Such emergency work as was required in district No. 5 was performed by officers under special orders. The service stations in this territory are few and, for the most part, adjacent to other districts.

Senior Surg. G. M. Magruder served throughout the year as district director of the sixth district, in addition to his duties as officer in charge of all service activities at the port of Seattle, Wash.

All Coast Guard stations within this district were inspected during the year, and the medical officers were examined for color sense and visual acuity, in addition to being instructed as to the methods of examining applicants. A conference was held with the department of business control of the State of Washington regarding the care of beneficiaries of the service, and a reduction in the charge for the care of insane beneficiaries was brought about. The daily rate was reduced from \$2.50 to \$1.50 per day, resulting in a saving of about \$300 monthly.

Doctor Magruder also made surveys of the local health departments at Spokane, Tacoma, and Seattle, Wash., and Portland, Oreg., during the year; held conferences with chamber of commerce representatives and shipping interests with respect to the inauguration of cyanide fumigation at Portland, Oreg.; served on boards at Seattle and Tacoma for the condemnation of narcotics seized by customs and Department of Justice authorities, and served as chairman of a board at San Francisco convened for the purpose of standardizing methods of examination of aliens for intestinal parasites.

Senior Surg. J. C. Perry continued in charge of district No. 7, with headquarters at San Francisco, Calif., throughout the fiscal year. An inspection of every service station within the district was made during the year, and reports were submitted on their activities. Larger stations were inspected twice. Coast Guard stations were also visited, and consultations held with the physicians furnishing relief to keepers and surfmen. State hospitals for the insane, to which beneficiaries of the service have been committed, were visited twice during the year. The director served on several examination boards, and on a special board for the purpose of formulating a uniform procedure in the examination of aliens for clonorchiasis at Pacific coast ports.

During the year the director made surveys of the health departments of San Francisco, Oakland, and San Diego, Calif. Close cooperation and contact with state and local health authorities was maintained, and very satisfactory work resulted from conferences with county supervisors and county horticultural commissioners in the counties in which rodent eradication has been prosecuted. This officer has charge of plague-control work in California conducted by the service.

#### COMMISSIONED MEDICAL OFFICERS

On July 1, 1923, the regular corps consisted of the Surgeon General, 4 assistant surgeons general at large, 20 senior surgeons, 119 surgeons, 34 passed assistant surgeons, and 23 assistant surgeons. Of this number, aggregating 201, 2 assistant surgeons general at large, 9 senior surgeons, 4 surgeons, and 3 passed assistant surgeons were carried on waiting orders. During the fiscal year the following changes occurred in the several grades: The Surgeon General was reappointed by the President with the advice and consent of the Senate for an additional period of four years; 1 surgeon was promoted to the grade of senior surgeon to fill a vacancy created by a death; 7 passed assistant surgeons were promoted to the grade of surgeon; 5 assistant surgeons were promoted to the grade of passed assistant surgeon; 5 candidates for appointment to the grade of assistant

surgeon were successful in the entrance examination prescribed by law and the regulations of the service, and were commissioned in that grade: 1 senior surgeon and 1 surgeon died; 1 assistant surgeon general at large and 1 surgeon were placed on waiting orders because of physical disability; 2 surgeons, 2 passed assistant surgeons, and 1 assistant surgeon resigned from the service.

On June 30, 1924, after these changes had occurred, the regular commissioned corps consisted of the Surgeon General, 4 assistant surgeons general at large, 20 senior surgeons, 122 surgeons, 30 passed assistant surgeons, and 22 assistant surgeons. Of these 199 officers, 3 assistant surgeons general at large, 8 senior surgeons, 5 surgeons, and 3 passed assistant surgeons were on that date on waiting orders. The total number is 19 less than in 1918, the difference being due to lack of suitable candidates to fill these vacancies.

Great difficulty has been experienced in securing candidates to take the entrance examinations. Nineteen examinations were held during the year in different parts of the country, but only 14 applicants applied. This is due to the shortage of recent medical graduates and to the greater financial returns to physicians engaged in private practice as compared with those in governmental positions.

At the close of the fiscal year 1924, seven surgeons were serving by detail as assistant surgeons general in charge of the divisions of the bureau in accordance with the acts approved July 1, 1902, and July 9, 1918. One assistant surgeon general at large, three senior surgeons, and two surgeons were on duty as directors of the public-health districts, one of the two surgeons being temporary director. One surgeon continued in general charge of the enforcement in Europe of outgoing quarantine measures applicable to vessels, their crews, and emigrants destined to ports in the United States and its dependencies. One assistant surgeon general, in addition to his regular duties, was acting, when necessary, in the capacity of assistant to the director of the International Sanitary Bureau, Washington, D. C. One surgeon was on detail as chief surgeon, Bureau of Mines, Department of the Interior, and one surgeon and one passed assistant surgeon were serving (the surgeon as medical director) on detail to the United States Employees' Compensation Commission.

### RESERVE OFFICERS

On July 1, 1923, the reserve commissioned officers on active duty numbered 839. At that time 1 assistant surgeon general, 36 senior surgeons, 285 surgeons, 10 dental surgeons, 317 passed assistant surgeons, 29 passed assistant dental surgeons, 88 assistant surgeons, and 14 assistant dental surgeons were on duty with the Veterans' Bureau, while 1 assistant surgeon general, 3 senior surgeons, 1 senior dental surgeon, 8 surgeons, 1 dental surgeon, 22 passed assistant surgeons, 7 passed assistant dental surgeons, 14 assistant surgeons, and 2 assistant dental surgeons were serving with the Public Health Service.

During the fiscal year 1924, the following changes occurred: 22 individuals received appointments, 20 officers were placed on active duty, 46 were promoted, 1 was demoted, 2 died, 59 resigned, 51 commissions of officers on active duty were terminated on account of inability to perform service, and 682 officers were placed on inactive status.

The commissions of 153 officers on the inactive list automatically terminated by reason of the expiration of the five-year period for which reserve officers are commissioned. Included in the 682 officers placed on inactive status during the fiscal year were 656 on duty with the United States Veterans' Bureau who were so placed at the close of business June 6, 1924, at the request made by the director of that bureau, in view of the enactment into law on June 7, 1924, of the legislation above mentioned, and the subsequent issuance of an Executive order. Renewal commissions were issued to 13 officers on active duty and to 5 officers on inactive status.

On June 30, 1924, after these changes had occurred, the reserve officers on active duty were 1 assistant surgeon general, 3 senior surgeons, 6 surgeons, 2 dental surgeons, 19 passed assistant surgeons, 10 passed assistant dental surgeons, 21 assistant surgeons, and 3 assistant dental surgeons. Three assistant surgeons general, 55 senior surgeons, 302 surgeons, 10 dental surgeons, 282 passed assistant surgeons, 22 passed assistant dental surgeons, 138 assistant surgeons, and 16 assistant dental surgeons were on the inactive list at the close of the fiscal year.

#### ATTENDING SPECIALISTS

On July 1, 1923, there were 112 attending specialists in the service, and during the fiscal year this number increased to 141, of which number 120 were consultants to marine hospitals, while 21 were available for call at second and third class relief stations.

At the close of the fiscal year 46 attending specialists were receiving nominal compensation of \$1 per annum, and 36 were carried on a fee basis to receive fixed fees for consultations, examinations, treatments, and major and minor operations; 59 were receiving annual salaries which in many cases were practically nominal.

#### ACTING ASSISTANT SURGEONS

On July 1, 1923, there were 455 acting assistant surgeons in the Public Health Service, and by June 30, 1924, this number had increased by 11.

Of the 466 acting assistant surgeons on duty June 30, 1924, 92 were on duty at marine hospitals, 294 were engaged in immigration, relief, and maritime, border, insular and foreign quarantine work; 4 were engaged in the prevention of trachoma; 17 were on duty in connection with field investigations of public health and rural sanitation; 1 was engaged in national park sanitation; 8 were on detail with the United States Coast Guard; 4 were serving with the Bureau of Mines, by detail, and 46 were engaged in anti-venereal disease activities as part-time employees at nominal compensation. Nine acting assistant dental surgeons were included in the 466 on duty at the close of the fiscal year.

On June 30, 1924, 13 vacancies existed in these positions. Eight of these vacancies were at marine hospitals, while 2 were in child-hygiene work, 1 was in trachoma work, 1 at Boston Quarantine Station, and 1 at Ellis Island Immigration Station.

With the establishment of a central list of eligibles in the office of the Civil Service Commission, resulting from an examination announced by the commission at the request of the Public Health

Service, several appointments for general field service were made. By recourse to this list of eligibles it is hoped to supplement the mobile establishment—the regular and reserve commissioned corps—by providing for field stations medical officers for duty not in a specific locality, but in the general field service. Officers appointed from this civil-service register are subject to service where the exigencies of the service require. By this means transfers of officers serving at isolated stations may be brought about, thereby affording them opportunity for professional improvement as well as providing relief in emergencies.

### INTERNES

On July 1, 1923, there were 19 internes in the service, 1 of whom was a student, and on June 30, 1924, there were 20, including 2 students. Internes are locally appointed under paragraphs 95, 96, and 97 of the service regulations for temporary periods of one year for duty at marine hospitals. Ten vacancies existed in positions of this class at the end of the fiscal year.

### CONTRACT DENTAL SURGEONS

Shortly after the beginning of the fiscal year it became apparent that part-time dentists would be necessary at the smaller marine hospitals and at second and third class relief stations where the amount of dental work to be done would not require the establishment of dental clinics or the services of dental reserve officers or acting assistant dental surgeons. Accordingly, a number of contract dental surgeons were appointed at marine hospitals and relief stations to receive fixed fees for dental work performed for service beneficiaries. The fees prescribed were made uniform throughout the service.

At the close of the fiscal year 6 contract dental surgeons were at marine hospitals and 21 were at second and third class relief stations.

### COLLABORATING EPIDEMIOLOGISTS

The number of collaborating and assistant collaborating epidemiologists was slightly increased during the fiscal year. Nearly all of these employees are health officers or employees of state or local boards of health, who furnish the service with reports of communicable diseases received by state or local health organizations. In most cases their compensation is \$1 per annum. During the year the number of collaborating epidemiologists was increased from 40 to 42, these appointees being on duty in the different States, and the number of assistant collaborating epidemiologists was increased from 4,216 to 4,261.

### HYGIENIC LABORATORY

At the close of the fiscal year the personnel of the Hygienic Laboratory included, in addition to the director and assistant director, 3 chiefs of divisions, 6 surgeons, 2 passed assistant surgeons, 1 assistant surgeon, 2 pharmacists, 2 technical assistants, 4 special experts, 1 pharmacologist, 1 assistant pharmacologist, 2 junior pharmacologists, 5 chemists, 3 assistant chemists, 1 biochemist, 4 bacteriolo-

gists, 2 assistant bacteriologists, 1 junior bacteriologist, 1 bacteriological technician, 2 biologists, 1 pathologist, 1 artist, 18 other technical employees, and 48 laboratory attendants, aides, and assistants.

### PHARMACISTS AND ADMINISTRATIVE ASSISTANTS

At the close of the fiscal year there were on duty 37 pharmacists and 20 administrative assistants in the service. The number of employees in this class of personnel remains practically the same. The death of one member of the pharmacist corps during the year was responsible for the decrease from 38 to 37.

At the end of the fiscal year the pharmacists and administrative assistants were classed as follows:

Pharmacists, first class.....	32
Pharmacists, second class.....	5
Administrative assistants, first class.....	5
Administrative assistants, second class.....	6
Administrative assistants, third class.....	8
Administrative assistants, fourth class.....	1

### BOARDS CONVENED

During the year 127 boards were convened throughout the various branches of the service. Six were convened for the physical examination of detained aliens; 7 for the examination of commissioned officers of the service to determine their fitness for promotion to the next higher grade; 19 for examination of applicants for appointment as assistant surgeon in the regular corps; 1 for the purpose of inspecting service property; 6 for the examination of scientific personnel to determine eligibility for promotion; 1 to examine pharmacists to determine eligibility for promotion; 1 for the purpose of examining a commissioned officer for waiting orders; 1 to consider questions submitted for opinion by the United States Civil Service Commission; 20 for the physical examination of Coast Guard employees for promotion; 2 for the physical examination of Coast Guard officers for promotion; 44 for physical examination of applicants for cadets in the United States Coast Guard; and 19 for the physical examination of candidates for temporary commissioned and temporary warrant officers of the United States Coast Guard.

### PERSONNEL STATEMENT

Following is a statement setting forth the totals and the distribution of personnel of the service on June 30, 1924. This does not include vacancies which existed on that date.

	Regular Corps						Reserve Corps						Act-ing-assist-ant sur-geon	At-tend-ing spe-cialist	Con-tract den-tal sur-geon	In-terne	Scien-tific per-son-nel	As-sist-ant col-lab-orating epi-demi-ologist
	Sur-geon gen-eral	As-sist-ant sur-geon at large	As-sist-ant sur-geon	Sen-lor sur-geon	Sur-geon	Passed as-sist-ant sur-geon	As-sist-ant sur-geon	As-sist-ant sur-geon	Sen-lor sur-geon	Sur-geon	Passed as-sist-ant sur-geon	As-sist-ant sur-geon						
	1				1													
			7		2	1				1								
					2	1			1				4					





Laredo, Tex.					1													3
Marcus Hook, Pa.					1													1
New Orleans, La.					4			1		1								3
Rosebank, N. Y.					2													11
San Francisco, Calif. (immigration and quarantine)					2				2									2
San Juan, P. R.					1													2
Foreign ports					9			4		4								69
All others					6													79
Total																		
Domestic quarantine division:																		
Texas-Mexican border																		
San Francisco, Calif.					1													2
Interstate																		7
Trachoma					4			1					1					1
Rural sanitation					4			4					4					6
All others					1													
Total																		
Scientific research division:																		
Hygienic Laboratory					7			3		1								
Leprosy investigation					2													
Malaria					2				1				2					8
Pellagra					1													
Stream pollution																		6
Sewage disposal																		
Industrial hygiene and sanitation					4								7				1	
Child hygiene					3								2				1	
Morbidity statistics								1									1	
All others					7												1	
Total																		
Sanitary reports and statistics division																		
Veneral-diseases division																		4,261
Miscellaneous			1	3	2			1					46	5				
Total	1	4	7	20	115	30	22	1	3	8	29	24	465	146	27	20	27	4,261

## Personnel of the Public Health Service June 30, 1924—Continued

	General and technical												Totals			
	Col- labo- rating epi- demi- ologist	Phar- ma- cist	Ad- min- is- trative assist- ant	Drug- gist	Nurse	Aide	Dieti- tian	Labo- ra- to- rian in genol- ogy	Labo- ra- to- rian in bac- teriol- ogy	Pilot	Ma- rine engi- neer	Clerk	All other employ- ees	Med- ical and scien- tific	Gen- eral and tech- nical	Grand total
BUREAU																
Surgeon General's office												4	2	2	6	
Chief clerk's office												31	26	11	57	
Divisions	1				3							143	5	2	152	
General inspection service												4		2	4	
Detailed to other offices	1											29	2	7	32	
Total														22	251	273
FIELD																
Coast Guard														16	2	16
General inspection service												2	4	11	16	
Federal park, Cecil County, Md	1															
Detailed to Veterans' Bureau																
Waiting orders																
Hospital division:														19		19
Marine Hospital No. 1, Baltimore, Md	1		1		17	2	2	1	1	1		8	54	22	87	
Marine Hospital No. 2, Boston, Mass	1		1		13	1	1	1	1	1		5	50	17	75	
Marine Hospital No. 3, Buffalo, N. Y	2				9	2	1	1	1	1		6	19	17	39	
Marine Hospital No. 5, Chicago, Ill	1				15	2	2	1	1	1		8	53	22	81	
Marine Hospital No. 6, Cleveland, Ohio	1				10	1	1	1	1	1		5	27	13	46	
Marine Hospital No. 7, Detroit, Mich	1				10	2						5	30	13	48	
Marine Hospital No. 8, Evansville, Ind	1				5							3	14	6	23	
Marine Hospital No. 9, Fort Stanton, N. Mex	1		1		12	2	1	1	1	1		14	100	8	133	
Marine Hospital No. 10, Key West, Fla	1				5							1	9	3	17	
Marine Hospital No. 11, Louisville, Ky	1				6		1	1	1			4	19	10	31	
Marine Hospital No. 12, Memphis, Tenn					5			1	1			4	18	7	28	
Marine Hospital No. 13, Mobile, Ala	1				8	1						5	25	9	40	
Marine Hospital No. 14, New Orleans, La	1		1		19	3	2	1	1	1		11	99	20	139	
Marine Hospital No. 15, Pittsburgh, Pa			1		7	1						3	16	5	29	
Marine Hospital No. 16, Portland, Me					5							2	15	13	23	
Marine Hospital No. 17, Port Townsend, Wash	1				10	1	1					2	28	6	44	
Marine Hospital No. 18, St. Louis, Mo	1				7			1	1			5	27	20	41	
Marine Hospital No. 19, San Francisco, Calif	2				33	6	2	1	1	1		6	89	17	141	
Marine Hospital No. 20, Savannah, Ga	1		1		9			1	1			5	23	12	40	
Marine Hospital No. 21, Stapleton, N. Y	2				29	3	2	1	1	1		14	128	16	181	

[illegible]

## Personnel of the Public Health Service, June 30, 1924—Continued

	General and technical											Total				
	Col- labo- rating epi- demi- ologist	Phar- macist	Ad- minis- trative assist- ant	Drug- gist	Nurse	Aide	Dieti- tian	Labo- rator- ian in genol- ogy	Labo- rator- ian in bac- teriol- ogy	Pilot	Ma- rine engi- neer	* Clerk	All other em- ploy- ees	Med- ical and sien- tific	Gen- eral and tech- nical	Grand total
FIELD—continued																
Scientific research division—Continued																
Child hygiene.....					3							4	7	6	14	
Morbidity statistics.....												7	3	1	10	
All others.....												14	14	9	28	
Total.....														61	232	293
Sanitary reports and statistics division																
Veneral-diseases division.....	42													4,261	42	4,303
Miscellaneous.....													15	51	15	66
Total.....	42	37	20	12	363	37	25	15	13	30	33	524	2,308	5,211	3,459	8,670

## FINANCIAL STATEMENT

The volume of work in the section of accounts has been heavy because of the number of appropriations and the numerous financial statements required.

Substantial progress has been made in the use of the allotment and encumbrance systems in the control of expenditures of appropriations. As a means to this end, copies of certificates of delivery covering all freight and express shipments are required to be mailed to the bureau by receiving officers. These certificates are immediately utilized to estimate the cost of transportation, thereby determining currently the general cost of freight and transportation to the service.

In order to unify and clarify the preparation of vouchers and to facilitate their audit and payment, instructions relating to this subject were set forth in detail for the information of field stations. By reason of suspensions in the payment of vouchers made by the General Accounting Office, from one to two clerks devoted their entire time throughout the year to the conduct of correspondence and investigative work necessary to secure the removal of these suspensions.

A tabulated financial statement appears as an appendix to this report.

## GENERAL INSPECTION SERVICE

On June 30, 1923, the southern general inspection area office was closed, the officer in charge being transferred to the United States Veterans' Bureau for duty, and the inspections in that area were undertaken by the general inspector in charge of the Atlantic general inspection area in addition to his duties in the Atlantic area.

This change left but two commissioned officers in the field. The former Atlantic, central, southern, and Pacific general inspection areas were discontinued, the Atlantic and southern being consolidated to form the eastern general inspection area, and the central and Pacific areas were combined to form the western general inspection area, the former with headquarters at New York City, the latter with headquarters at Cincinnati, Ohio.

During the fiscal year 1923-24, there were the following stations under inspection by the general inspection service:

United States marine hospitals.....	25
United States Public Health Service relief stations, second, third, and fourth class.....	109
Hospitals under contract with the United States Public Health Service (in connection with relief stations).....	165

Inspections and investigations were made as follows:

Special investigations.....	18
Inspections: <sup>1</sup>	
Marine hospitals.....	46
Relief stations.....	76
Contract hospitals.....	88
Property condemnations.....	50
Charges and specifications prepared.....	6
Cases referred to the Department of Justice.....	2

The following table indicates the number of officers on duty during the various months of the year, the stations visited, and mileage traveled:

Date	Number of officers	Stations visited	Mileage
1923			
July.....	4	60	8,754
August.....	4	19	3,661
September.....	4	29	4,563
October.....	4	28	4,390
November.....	4	13	6,430
December.....	4	36	4,746
1924			
January.....	4	17	1,563
February.....	4	21	2,806
March.....	4	35	5,023
April.....	4	23	5,746
May.....	4	19	2,609
June.....	4	22	2,703
Total.....		322	52,994

<sup>1</sup> Under orders from the Surgeon General, no investigations or inspections of Marine hospitals, relief stations, or contract hospitals in the former Pacific general inspection area were undertaken by the general inspection service during the fiscal year 1923-24. (This includes three United States marine hospitals and 13 relief stations.)

The following table shows the number of hospitals and stations subject to inspection, the number of inspections, and percentage of inspections:

Stations	Number subject to inspec- tion	Number of inspec- tions made	Propor- tion of inspec- tions
United States marine hospitals.....	<sup>1</sup> 22	46	<i>Per cent</i> 209.0
Relief stations, second, third, and fourth class.....	<sup>2</sup> 96	76	79.1
Contract hospitals.....		88	

<sup>1</sup> Exclusive of the three marine hospitals in Pacific area.

<sup>2</sup> Exclusive of the 13 relief stations in Pacific area.

13034—24†——19

## CHIEF CLERK'S OFFICE

### FORCE ON DUTY IN THE BUREAU

At the end of the fiscal year 1924, the number of employees on duty in the Bureau was 261, which included 29 employees detailed to the Bureau of Supply, 3 to the Treasury Department, and 1 to the Personnel Classification Board. This represented a reduction of 18 employees during the year, due very largely to increased efficiency.

The efficiency rating system was continued during the year and formed the basis for all promotions. The ratings are reviewed and adjusted by the bureau board of review, a permanent body consisting of representatives detailed by the various divisions of the bureau. This board also gives consideration to all suggested promotions in the grades covered by the efficiency ratings and submits recommendations to the Surgeon General in respect thereto. Whenever directed by the Surgeon General, the board likewise investigates requests for higher grades under the classification act, and makes reports thereon for the Surgeon General's information.

### BUILDINGS AND OFFICE QUARTERS

The bureau now occupies approximately one wing of temporary building C, one-third of a wing of temporary building F, and a portion of the Butler Building. These quarters have been kept in good condition and are reasonably satisfactory, except for the fire hazard in the temporary buildings.

### PUBLIC HEALTH SERVICE LIBRARY

The library now contains 10,536 volumes and 4,450 pamphlets. During the year 950 volumes and 650 pamphlets were acquired, largely through gift and exchange. The annual appropriation of \$500 was used chiefly in securing necessary scientific journals, leaving but a small sum for purchase of books.

Prof. S. Homer Woodbridge, of Boston, Mass., has donated to the bureau his personal library of 575 volumes and 400 pamphlets pertaining to the general subject of ventilation. This valuable collection was the result of many years of effort, and contains many books and pamphlets of great interest from a historical standpoint.

In order to meet the widely varying requests for books, the librarian borrowed many volumes from the Library of Congress, the library of the Surgeon General of the Army, and from other Government establishments, and was occasionally able to extend similar cooperation. Books are loaned, upon request, to officers of the service working at points outside of Washington.



## IMPROVEMENTS

The new bureau files system was developed and extended, and the mail room was consolidated with the general files in the interest of efficiency. An inquiry is under way looking to the improvement of the files methods in the field service.

By consolidation of supervisory duties, one section in the chief clerk's office was abolished, thus saving the salary of a section chief. A smaller telephone switchboard was also installed, effecting material economy in fixed charges. Improved machinery, from surplus property, was placed in the carpenter shop, materially increasing its capacity. Economy in telegraph service was effected by rigid enforcement of regulations against misuse, by utilizing the mails whenever practicable, and by taking full advantage of the War and Navy Department lines and radio service.

The number of cases of tardiness, through careful restrictive measures, was materially reduced, being only  $2\frac{1}{2}$  cases for each employee per annum, as compared with  $3\frac{1}{2}$  per employee for the preceding year.

## RECOMMENDATIONS

### ENLARGEMENT OF INVESTIGATIONAL ACTIVITIES

The investigation of contagious and infectious diseases and matters pertaining to the public health is an essential function of the Federal Government. The scientific studies thus far made have been attended by results the value of which were far in excess of their cost. It is recommended that adequate facilities be provided to insure the continuance and enlargement of this scientific work. The discoveries already made are of a twofold nature, some of them furnishing solutions of immediately pressing health problems and others providing fundamental facts relating to the more obscure underlying problems of health; both are essential but the latter must eventually be of greater value and should in consequence receive full recognition. The maintenance by the Government of efficient and unbiased scientific workers available to render trustworthy opinions on public health matters constitutes an invaluable service on behalf of the people and results in nation-wide economy, since their services and the results of their work are constantly at the disposal of Federal, State, and local health authorities.

### PREVENTION OF THE SPREAD OF DISEASES IN INTERSTATE TRAFFIC

Through cooperation with State and local authorities the sanitation necessary for the protection of interstate traffic may best be effected. In order that efficient supervision over this activity may be maintained adequate funds should be provided. There is special need of the extension of this work so as to include all the water supplies used aboard trains and vessels engaged in interstate traffic, which is not now the case. It is necessary also in the interest of the national health to bring about through cooperative activity the establishment of "full-time" county health work generally.

### NATIONAL QUARANTINE SERVICE

Accommodations for the detention of passengers are needed at Mobile, Ala., and at Sabine Pass, Tex. A bill providing for the former has passed the House of Representatives. It is recommended that favorable consideration be given these two projects and that provision be made for major repairs of existing quarantine stations, regarding which recommendations have been submitted in separate communication.

### CONSTRUCTION AND REPAIRS OF HOSPITALS

As mentioned in preceding annual reports, many marine hospitals are in need of repairs provision for which requires legislative action. This need is increasing by reason of the growing demands for hos-

pital relief under existing laws and the fact that deterioration of the buildings is cumulative. Funds intended by the Committee on Public Buildings and Grounds for construction and major repairs to marine hospitals and actually appropriated by the act of March 4, 1921, were devoted instead to hospitals for ex-service patients.

In special communications recommendations have been made for funds for the necessary construction and major repairs to marine hospitals especially at New Orleans, San Francisco, Baltimore, New York, Mobile, Carville, and Fort Stanton, and new hospitals at Seattle, Wash., and Galveston, Tex. Request is here made for favorable consideration of these recommendations.

### CONTROL OF VENEREAL DISEASES

With the general recognition of the importance of the control of venereal diseases, need becomes apparent for the appropriation of sufficient funds to enable the Government not only to maintain this activity as in previous years but to enlarge its scope. No group of diseases causes greater economic loss nor as seriously affects physical stamina. It is earnestly recommended therefore that adequate appropriations be made annually for the continuance of this activity.

### PERSONNEL

The higher standards of medical education and consequent smaller number of graduates in recent years have caused increased difficulties in securing additions to the corps of commissioned medical officers. Difficulty has also been experienced in securing competent physicians to aid in the conduct of service work. Existing law requires officers on entering the service to serve four years before promotion. Recommendation is renewed that the period of service in the grade of assistant surgeon be three years. A more essential provision would be the enlargement of the commissioned corps in order to establish uniformity in the matter of appointment and conditions of service of professional and scientific personnel performing similar public-health duties. This is the most urgent need as relates to personnel. By reason of the diversity of duties and the emergency nature of these duties mobility of personnel is essential. Under present conditions of appointment there is great limitation in this respect. It is recommended that it be removed by the enactment of law for the enlargement of the commissioned corps and consequent limitation of appointments under different status.

HUGH S. CUMMING,  
*Surgeon General.*

To the honorable A. W. MELLON,  
*Secretary of the Treasury.*

THE UNIVERSITY OF CHICAGO

To the Honorable A. W. Johnson,  
Secretary of the Treasury.

# APPENDIX

## FINANCIAL STATEMENT

The following is a statement of expenditures from appropriations for the Public Health Service for the fiscal year 1924:

Appropriation	Amount appropriated	Obligations			Unobligated balance
		Incurred	Liquidated	Outstanding	
Salaries, office of Surgeon General, Public Health Service.....	\$90,720.00	\$87,811.31	\$87,811.31	-----	\$2,908.69
Books, Public Health Service.....	500.00	498.00	448.50	\$49.50	2.00
Freight, transportation, etc., Public Health Service.....	37,500.00	37,269.41	28,804.60	8,464.81	230.59
Maintenance, Hygienic Laboratory, Public Health Service.....	45,000.00	43,080.97	38,675.14	4,405.83	1,919.03
Pay, etc., commissioned officers and pharmacists, Public Health Service.....	1,115,354.84	1,073,538.49	1,070,077.72	3,460.77	41,816.35
Pay of acting assistant surgeons, Public Health Service.....	300,000.00	293,211.55	288,598.43	4,613.12	6,788.45
Pay of other employees, Public Health Service.....	840,000.00	822,418.86	829,708.54	2,710.32	7,581.14
Preparation and transportation of remains of officers, Public Health Service.....	3,000.00	955.08	955.08	-----	2,044.92
Pay of personnel and maintenance of hospitals, Public Health Service.....	1,518,219.09	4,854,625.68	4,721,237.32	133,388.36	263,593.41
Medical and hospital services, Veterans' Bureau (transfer to Public Health Service, act Feb. 13, 1923).....	332,150.00	288,567.71	288,391.45	176.26	43,582.29
Salaries and expenses, Veterans' Bureau (transfer to Public Health Service, act Feb. 13, 1923).....	2,961,450.00	2,715,200.78	2,710,595.59	4,605.19	246,249.22
Quarantine service.....	488,000.00	470,261.85	428,110.85	42,151.00	17,738.15
Preventing the spread of epidemic diseases.....	335,042.78	297,675.47	288,182.76	9,492.71	37,367.31
Field investigations of Public Health.....	279,436.00	273,606.47	267,990.64	5,615.83	5,829.53
Interstate quarantine service.....	23,000.00	21,933.92	20,673.57	1,260.35	1,066.08
Studies of rural sanitation, Public Health Service.....	50,000.00	49,874.80	38,347.89	11,526.91	125.20
Control of biologic products, Public Health Service.....	41,500.00	40,729.81	38,954.28	1,775.53	770.19
Expenses, division of venereal diseases, Public Health Service.....	227,353.00	194,640.07	192,443.89	2,196.18	32,712.93
Increase of compensation, Treasury Department.....	739,260.00	723,501.74	723,501.74	-----	15,758.26
Marine hospital, Baltimore, Md.....	<sup>2</sup> 5,782.41	5,395.29	5,395.29	-----	387.12
Marine hospital, Savannah, Ga.....	<sup>2</sup> 5,932.14	4,804.07	296.12	4,507.95	1,128.07
Quarantine station, Boston, Mass.....	<sup>2</sup> 7,020.67	3,110.00	2,992.00	118.00	3,910.67
Boston, Mass., marine hospital.....	<sup>2</sup> 6,809.26	-----	-----	-----	6,809.26
Marine hospital, New Orleans, La.....	<sup>2</sup> 960.07	-----	-----	-----	960.07
Marine hospital, San Francisco, Calif.....	<sup>2</sup> 892.02	-----	-----	-----	892.02
Marine hospital, Cleveland, Ohio.....	<sup>2</sup> 1,474.95	-----	-----	-----	1,474.95
Quarantine station, Cape Charles.....	<sup>2</sup> 5,689.98	-----	-----	-----	5,689.98
Quarantine station, Brunswick, Ga.....	<sup>2</sup> 1,708.87	-----	-----	-----	1,708.87
Quarantine station, Charleston, S. C.....	<sup>2</sup> 634.46	-----	-----	-----	634.46
Quarantine station, Columbia River.....	<sup>2</sup> 5,297.56	-----	-----	-----	5,297.56
Quarantine station, Delaware Breakwater.....	<sup>2</sup> 857.00	-----	-----	-----	857.00
Quarantine station, Gulf.....	<sup>2</sup> 353.35	-----	-----	-----	353.35
Quarantine station, Mobile, Ala.....	<sup>2</sup> 10,000.00	-----	-----	-----	10,000.00
Quarantine station, Honolulu.....	<sup>2</sup> 390.52	-----	-----	-----	390.52
Quarantine station, New Orleans, La.....	<sup>2</sup> 11,150.00	-----	-----	-----	11,150.00
Quarantine station, Pensacola, Fla.....	<sup>2</sup> 18.02	-----	-----	-----	18.02
Quarantine station, Reedy Island.....	<sup>2</sup> 66.71	-----	-----	-----	66.71
Quarantine station, San Francisco, Calif.....	<sup>2</sup> 1,692.46	-----	-----	-----	1,692.46
Quarantine station, Savannah, Ga.....	<sup>2</sup> 410.85	-----	-----	-----	410.85
	13,094,627.01	12,312,711.33	12,072,192.71	240,518.62	781,915.68

<sup>1</sup> Includes \$248,294.09 reimbursements for care and treatment of Veterans' Bureau patients.  
<sup>2</sup> Balance available as of June 30, 1923.

## PREVENTING THE SPREAD OF EPIDEMIC DISEASES

Statement showing detailed expenditures, as required by act approved March 6, 1920:

Purpose	Allotted	Obligations			Unobligated balance
		Incurred	Liquidated	Out-standing	
Traveling expenses, telegrams, etc., of regional directors engaged in epidemic work.....	\$3, 000. 00	\$135. 57	\$135. 57	-----	\$2, 864. 43
Trachoma prevention.....	59, 400. 00	58, 526. 00	57, 652. 66	\$873. 34	874. 00
Expenses at foreign quarantine stations and certain ones in the United States engaged in epidemic work.....	155, 360. 25	151, 093. 44	144, 063. 22	7, 030. 22	4, 266. 81
Rocky Mountain spotted fever control, including maintenance of laboratory at Hamilton, Mont.....	24, 000. 00	18, 296. 48	17, 501. 91	794. 57	5, 703. 52
Postage for mailing epidemic reports to foreign countries.....	1, 000. 00	856. 89	856. 89	-----	143. 11
Vaccine and vaccine points at United States marine hospitals and relief stations of second, third, and fourth classes.....	212. 34	156. 98	73. 27	83. 71	55. 36
Payment of personnel and other expenses of quarantine division in connection with plague activities.....	69, 100. 00	68, 610. 11	67, 599. 24	710. 87	489. 89
Unallotted balance.....	22, 970. 19	-----	-----	-----	22, 970. 19
<b>Total.....</b>	<b>335, 042. 78</b>	<b>297, 675. 47</b>	<b>288, 182. 76</b>	<b>9, 492. 71</b>	<b>37, 367. 31</b>

Analysis of expenditures in accordance with General Accounting Office Bulletin No. 1 of May 11, 1922:

## PERSONAL SERVICES

01	Personal services.....	\$224, 856. 14
0150	Special personal services.....	108. 25
01	<b>Total, personal services.....</b>	<b>224, 964. 39</b>

## SUPPLIES AND MATERIALS

0200	Stationery and office supplies.....	766. 12
0210	Medical and hospital supplies.....	2, 579. 73
0220	Scientific and educational supplies.....	3, 201. 61
0230	Fuel.....	1, 813. 68
0240	Wearing apparel and sewing supplies.....	289. 22
0250	Forage and supplies for animals.....	940. 92
0260	Provisions.....	10, 566. 46
0280	Sundry supplies.....	638. 21
0290	Materials.....	185. 94
02	<b>Total, supplies and materials.....</b>	<b>20, 981. 89</b>
0310	Furnishing of lodging.....	48. 00

## TELEPHONE AND TELEGRAPH SERVICE

050	Telegraph service.....	190. 52
051	Telephone service.....	602. 12
05	<b>Total, telephone and telegraph service.....</b>	<b>792. 64</b>
06	Travel expenses.....	25, 991. 60
07	Transportation of things.....	2, 363. 76
10	Heat, light, power, and water.....	938. 95
11	Rents.....	6, 312. 02
12	Repairs and alterations.....	541. 26
13	Miscellaneous current expenses.....	2, 717. 89
3000	Automotive equipment.....	76. 72
3010	Furniture and fixtures.....	2, 009. 01
3050	Other equipment.....	386. 73
3020	Educational, scientific, and recreational equipment.....	57. 90
	<b>Total expenditures.....</b>	<b>288, 182. 76</b>

## QUARANTINE SERVICE—EXPENDITURES BY STATIONS

Name of station	Pay and allowances of officers and employees	Maintenance	Total
Baltimore, Md.	\$30,656.76	\$27,014.32	\$57,671.08
Beaufort, S. C.	931.44	218.15	1,149.59
Biscayne Bay, Fla.	1,433.67	84.00	1,517.67
Boca Grande, Fla.	2,639.09	494.81	3,153.81
Boston, Mass.	50,291.86	28,313.26	78,605.12
Brownsville, Tex.	8,707.44	763.43	9,470.87
Brunswick, Ga.	5,358.84	2,865.97	8,224.81
Cape Fear, N. C.	9,098.88	3,364.60	12,463.48
Cedar Keys, Fla.	440.00		440.00
Charleston, S. C.	16,259.08	1,924.88	18,183.96
Columbia River, Oreg.	16,050.82	3,678.96	19,729.78
Coos Bay, Oreg.	720.00		720.00
Cumberland Sound, Fla.	3,720.44	77.04	3,797.48
Delaware Breakwater, Del.	1,427.50	364.10	1,791.60
Delaware Bay and River	9,702.16	11,192.51	20,894.67
Eagle Pass, Tex.	15,182.50	1,529.48	16,711.98
Eastport, Me.	1,450.00		1,450.00
El Paso, Tex.	30,948.98	5,208.44	36,157.42
Eureka, Calif.		46.50	46.50
Fort Monroe, Va.	51,195.82	19,718.46	70,914.28
Freeport, Tex.	2,058.00	454.50	2,512.50
Galveston, Tex.	33,451.32	17,723.09	51,174.41
Georgetown, S. C.	160.00		160.00
Gloucester, Mass.		360.00	360.00
Gulfport, Miss.	5,209.40	1,158.81	6,368.21
Hidalgo, Tex.	3,076.50	159.00	3,265.50
Key West, Fla.	7,736.56	1,548.05	9,284.61
Laredo, Tex.	20,233.35	3,181.77	23,415.12
Marcus Hook, Pa.	30,259.07	14,620.02	44,879.09
Mobile, Ala.	21,287.24	10,624.02	31,911.26
New Orleans, La.	39,200.41	14,259.46	53,459.87
Newport, R. I.		40.00	40.00
New York, N. Y.	234,318.84	128,933.45	363,252.29
Pascagoula, Miss.	535.00	15.80	550.80
Pensacola, Fla.	10,661.21	3,189.62	13,850.83
Perth Amboy, N. J.	1,486.66	1,200.00	2,686.66
Port Angeles, Wash.		129.00	129.00
Port Aransas, Tex.	3,758.00	115.98	3,873.98
Port Arthur, Tex.	11,191.47	1,929.18	13,120.65
Port Townsend, Wash.	21,649.65	4,760.74	26,410.39
Portland, Me.	14,231.34	7,262.20	21,493.54
Presidio, Tex.	3,351.50	943.57	4,295.07
Providence, R. I.	16,869.17	2,628.41	19,497.58
Reedy Island, Del.	7,583.49	2,003.55	9,587.04
Rio Grande, Tex.	5,563.36	29.76	5,593.12
Sabine, Tex.	20,542.26	5,471.95	26,014.21
St. Andrews, Fla.	805.00	73.50	878.50
St. George Sound, Fla.	303.33	181.00	484.33
St. Johns River, Fla.	4,535.04	2,274.09	6,809.13
St. Joseph, Fla.		110.00	110.00
San Diego, Calif.	8,616.84	3,214.89	11,831.73
San Francisco, Calif.	68,432.32	31,321.63	99,753.95
San Pedro, Calif.	9,153.21	8,126.48	17,279.69
Savannah, Ga.	15,169.17	4,145.83	19,315.00
Tampa Bay, Fla.	11,037.90	6,365.09	17,402.99
Terlingua, Tex.	1,357.00		1,357.00
Vineyard Haven, Mass.		10.00	10.00
Texas City, Tex.	2,089.00		2,089.00
Seattle, Wash.	10,367.08	5,033.99	15,401.07
Leprosy Investigation, Honolulu	13,248.32	745.23	13,993.55
Traveling expenses, telegrams, etc.		15,668.76	15,668.76
Honolulu	22,446.16	9,756.16	32,202.32
Porto Rico	38,044.58	10,238.67	48,283.25
Roma, Tex.		28.00	28.00
St. Thomas, Virgin Islands	14,411.03	1,186.69	15,597.72
	990,664.97	428,110.85	1,418,775.82





# INDEX

## A

	Page
Absenteeism because of sickness in school children.....	39
Absenteeism, industrial.....	S, 27
Acting assistant surgeons, number on duty.....	272
Addiction, narcotic-drug.....	9, 58, 63
Administrative assistants, number on duty.....	274
Ajo, Ariz., immigration transactions at.....	173
Alabama, work of the venereal disease division with the colored population of.....	244
Alien passengers:	
Inspected and certified.....	170
Report of medical certificates relating to.....	182
Aliens:	
Arriving at the Philippines, nationalities represented by the.....	185
Certified for mental condition, race of.....	183
Medical inspection of.....	166
Alien seamen:	
Inspected and certified.....	167
Report of medical certificates relating to.....	182
Alum process for clarification of water.....	61
American Engineering Standards Committee, cooperation with.....	8, 31
American Social Hygiene Association.....	247
Anemia, prevalence of.....	175
Antisymphilitic drugs, studies of.....	9, 61
Appendix (financial statement).....	289
Appropriations ( <i>see also</i> Financial statement):	
For venereal diseases, Federal and State.....	237
For venereal-disease prevention work, table showing.....	250
Arkansas, work of the venereal disease division with the colored population of.....	244
Arsenicals, analysis of.....	60
Arsphenamin:	
Chart showing doses administered through State boards of health....	242
Distribution of.....	241
Table showing State report of doses of.....	261
Astoria, Oreg., immigration transactions at.....	173
Attending specialists:	
At United States marine hospitals.....	211
Number on duty.....	272

## B

Baltimore, Md., quarantine transactions at.....	114
Barre, Vt., studies in silica dust.....	25
Beneficiaries and pay patients of the Public Health Service.....	201
Beriberi, prevalence of.....	188
Biologic products, Hygienic Laboratory.....	55
Biologic specimens, table of examination of.....	56
Birth rates.....	2
Boards convened.....	274
Boston, Mass.:	
Immigration transactions at.....	173
Quarantine transactions at.....	115
Brownsville, Tex.:	
Immigration transactions at.....	175
Quarantine transactions at.....	138
Bryce Canyon National Park.....	100
Buildings and office quarters of bureau.....	284

## C

	Page
Calexico, Calif., immigration transactions at.....	175
Cancer.....	7, 12, 62
Carbon monoxide poisoning, chronic.....	27
Cardio-renal, prevalence of.....	175
Carriers equipped with purification apparatus, table of.....	93
Carville, La., United States marine hospital.....	4, 213
Cerebrospinal fever, prevalence of.....	188
Chancroid, charts showing cases reported to State boards of health.....	238
Charts:	
Average per diem cost of in-patient relief, United States marine hos- pitals.....	217
Cases of venereal diseases reported to State boards of health..	238, 239, 240
Death rate from diphtheria.....	196
Doses of arsphenamin administered through State boards of health..	242
Film showings, lectures and exhibits of venereal disease division....	247
Increase in amount of hospital relief.....	200
Pamphlets and placards of venereal disease division purchased and reprinted by State boards of health.....	247
Patients admitted to venereal disease clinics.....	241
Patients discharged from venereal disease clinics as noninfectious....	241
Chemistry, division of.....	59
Chief clerk's office, report of.....	284
Child hygiene.....	8, 37
Communicable diseases.....	39
Cooperation of the statistical office with division of.....	47
District of Columbia.....	41
Hagerstown, Md.....	38
Lighting of school buildings.....	8
Natural illumination of classrooms.....	8, 40
Nevada.....	38
Nutrition.....	8, 40
Oral hygiene.....	8, 37
Physical development.....	37
Sickness as a cause of absenteeism.....	39
Survey of mentally and physically handicapped children.....	41
Weight and height of school children.....	8
Cholera, prevalence of.....	3, 4, 111, 147, 158
Clarification of water, alum process for.....	61
Classification of bureau employees.....	284
Classification of field service.....	267
Clinics, venereal disease.....	236, 239
Chart showing patients admitted to.....	241
Hot Springs, Ark.....	242
Patients discharged as noninfectious from.....	241
Table showing report for.....	252
Table showing the States ranked according to the monthly and daily admissions.....	260
Clinical laboratory report of marine hospitals, table showing.....	210
Clinical work of the Hygienic Laboratory, table of.....	59
Clonorchiasis, prevalence of.....	7, 12, 187
Coast Guard, United States.....	4, 203
Collaborating and assistant collaborating epidemiologists:	
Number on duty.....	191, 273
Report of work done by.....	190
Columbia River, Oreg., quarantine transactions at.....	116
Commissioned medical officers, number on duty.....	270
Common carriers' water supplies, supervision of.....	77
Consulting service, cooperation with.....	31
Contract hospitals.....	207
Construction and repairs of hospitals, recommendations for the.....	286
Cooperation with—	
American Engineering Standards Committee.....	31
Bureau of Mines.....	30
Bureau of Standards, United States.....	30
Consulting service.....	31
Government departments, scientific research division.....	30

Cooperation with—Continued.	Page
Health committee of the League of Nations.....	63
Post Office Department.....	30
Revision committee of the United States Pharmacopoeia.....	63
State and local health agencies on questions of industrial hygiene and sanitation.....	8
Statistical office with other organizations of the service.....	46
Cooperative measures with State and city governments.....	5
Costs:	
In-patient relief, United States marine hospitals, chart showing average per diem.....	217
Marine hospitals, operating.....	4, 205
Course in vital statistics for commissioned officers.....	46
Court decisions pertaining to venereal diseases.....	248
Crater Lake National Park.....	99
Cures for tuberculosis, experimental work with.....	9, 57
Cyanogen chloride as a new fumigation gas.....	28
Cysteine, a specific test for.....	60

## D

Deaths in United States marine hospitals and relief stations, table showing causes of.....	230
Death rates.....	2
Delaware Bay and River quarantine station, transactions at.....	116
Delousing procedure at New York quarantine station.....	127
Dental surgeons, number on duty.....	273
Dentistry.....	211
Detroit, Mich., smallpox outbreak in.....	110
Dextrocardia, prevalence of.....	188
Diphtheria:	
Chart showing death rate from.....	196
Cooperation with Johns Hopkins University School of Hygiene and Public Health in epidemiological study of.....	34
Prevalence of.....	1, 9, 175, 195
Reduction in number of deaths from.....	1
Table showing death rate from.....	196
Diseased persons, supervision of interstate travel of.....	110
Diseases in interstate traffic, recommendations for the prevention of the spread of.....	286
Diseases, prevalence of—	
Anemia.....	175
Beriberi.....	188
Cardio-renal.....	175
Cerebrospinal fever.....	188
Cholera.....	3, 4, 111, 147, 158
Clonorhiasis.....	187
Dextrocardia.....	188
Diphtheria.....	1, 9, 175, 195
Grippe.....	9
Influenza.....	9
Leprosy.....	120, 138, 141, 146, 147, 161, 164, 177, 186
Measles.....	1, 9, 115, 188, 196
Mumps.....	188
Plague.....	3, 4, 111, 114, 147, 158, 160, 161
Pneumonia.....	9
Scabies.....	188
Scarlet fever.....	1, 9, 164, 196
Smallpox.....	2, 3, 5, 111, 114, 116, 118, 123, 135, 138, 142, 147, 148, 154, 158, 164, 165, 183, 197
Tonsillitis.....	9
Trachoma.....	5, 174
Tuberculosis.....	2, 197
Tuberculosis, miliary.....	175
Typhoid fever.....	2, 197
Typhus fever.....	3, 5, 112, 115, 123, 140, 158
Whooping cough.....	1, 9
Uncinariasis.....	187, 188
Yellow fever.....	3, 5, 7, 112, 124, 134

Diseases, studies of. ( <i>See</i> Investigations.)	Page
Disinfection of vessels in the Philippines	149
District of Columbia, studies in child hygiene	41
Distriets, public health	268
Domestic quarantine. ( <i>See</i> Interstate quarantine.)	
Douglas, Ariz., immigration transactions at	175
Dust in industry, studies of	24

## E

Economies in the procurement of medical and hospital supplies	206
Education of sanitarians, activities recommended by the advisory committee	75
Education, section of public health	198
Ellis Island, N. Y., United States marine hospital at	218
El Paso, Tex.:	
Immigration transactions at	176
Quarantine transactions at	138
Employees Compensation Commission, United States	4, 202
Equipment and supplies purchased by the hospital division	207
Europe:	
Sanitary conditions in	158
Service operations in	156
Examinations, physical, at hospitals and relief stations	210
Excreta-disposal studies	52
Exhibits of venereal disease division	246, 247, 262

## F

Fatigue, chemical and physiological aspect of industrial	26
Federal and State appropriations for venereal diseases	237
Federal laboratory, operations of	68
Field service, classification of	267
Field service of venereal disease division	243
Film showings of venereal disease division	246, 247, 262
Financial statement	281, 289
"First aid," examination and instruction of ships' officers in	212
Florida, venereal disease campaign among railroad workers in	237
Food poisoning	7, 13
Foreign and insular quarantine, and immigration, division of:	
Changes in quarantine procedure	112
General prevalence of quarantinable diseases	111
Medical inspection of aliens	166
Quarantine transactions	111
Reports from immigration stations	173
Report of division of	111
Summary of quarantine transactions	166
Transactions at continental quarantine stations	114
Transactions at foreign ports	156
Transactions at insular quarantine stations	141
Violation of quarantine laws	113
Fort Stanton, N. Mex., United States marine hospital at	215
Frontera, Mexico, quarantine transactions at	160
Fumigation of ships	114, 117, 120, 128, 135, 136, 152, 162, 165

## G

Galveston, Tex., quarantine transactions at	116
General Grant National Park	99
General inspection service:	
Report of	282
Table showing inspections made	282
Georgia, oral hygiene in	38
Glacier National Park	99
Gonorrhea, charts showing cases reported to State boards of health	238, 239, 240
Goiter	7, 13
Government buildings, sanitary inspection of	110
Grand Canyon National Park	99
Grippe ( <i>see also</i> Influenza)	9
Guayaquil, Ecuador, quarantine transactions at	160

## H

	Page
Habana, Cuba, quarantine transactions at.....	161
Hagerstown, Md.:	
Child hygiene in.....	38
Studies in cement dust.....	25
Hawaiian Islands, quarantine transactions in.....	141
Health information by radio.....	199
Health surveys.....	8
Hidalgo, Tex., quarantine transactions at.....	139
Historical and miscellaneous data on marine hospitals.....	208
Hospital division, report of.....	200
Attending specialists.....	211
Average per diem cost of in-patient relief, United States marine hospitals.....	217
Causes of admission for discharged patients and condition on discharge, United States marine hospitals and relief stations.....	228
Causes of death in United States marine hospitals and relief stations.....	230
Classes of beneficiaries.....	201
Clinical laboratory report of marine hospitals, table showing.....	210
Contract hospitals.....	207
Cooperation of the statistical office with.....	47
Dentistry.....	211
Economies in the procurement of medical and hospital supplies.....	206
Examination and instruction of ships' officers in "first aid".....	212
Medicinal liquors and drugs for vessels and miscellaneous functions.....	204
Model ships' medicine chest.....	213
Number of days in hospital for patients discharged from United States marine hospitals and relief stations, by broad groups of conditions and class of beneficiary.....	234
Number of patients of each class of beneficiary discharged from United States marine hospitals and relief stations, by broad groups of conditions.....	232
Number of patients treated annually.....	220
Nursing, dietetic, and reconstruction section.....	219
Operating costs in marine hospitals.....	205
Physical examinations.....	210
Public Health Service supply depot at Perry Point, Md.....	206
Radio medical advice to ships at sea.....	213
Relief furnished at United States marine hospitals and relief stations, classified by beneficiary.....	225
Repairs and improvements.....	212
Rontgenology.....	211
Special and representative marine hospitals.....	213
Supplies and equipment purchased.....	207
Surgical operations performed at United States marine hospitals, table showing.....	209
Transactions at United States marine hospitals and relief stations.....	221
United States Coast Guard.....	203
United States Employees' Compensation Commission.....	202
United States marine hospital, table showing historical and miscellaneous data.....	208
United States Shipping Board.....	204
United States Veterans' Bureau.....	204
Hospital relief, chart showing increase in amount of.....	200
Hospital supplies, economies in the procurement of medical and.....	206
Hospital treatment of patients.....	4
Hot Springs, Ark., venereal disease clinic at.....	242
Hospitals:	
Contract.....	207
Operating costs in marine.....	205
Recommendations for the constructions and repairs of.....	286
Hygiene and Sanitation, Industrial.....	7, 24
Hygienic Laboratory:	
Biologic products.....	55
Clinical work, table of.....	59
Division of chemistry.....	59
Division of pathology and bacteriology.....	55

Hygienic Laboratory—Continued.	Page
Division of pharmacology.....	61
Division of zoology.....	59
Interchange of students with European laboratories.....	54
Investigation of Malta fever.....	57
Investigation of narcotic-drug addiction.....	58
Investigation of pneumonia.....	57
Investigation of trachoma.....	58
Investigation of tuberculosis.....	57
Investigation of tularaemia.....	57
Meetings of sanitary and scientific associations.....	64
Number on duty at.....	273
Publications.....	64
Report of.....	54
Specimens examined, table of.....	59
Viruses, serums, toxins, and analogous products.....	64

## I

Illinois:	
Oral hygiene in.....	37
Survey of mentally and physically handicapped children.....	41
Illinois River, reports on pollution of.....	48
Illumination.....	25
Illumination surveys in Government buildings in Washington, D. C.....	31
Immigration stations:	
Reports from.....	175
Ajo, Ariz.....	173
Astoria, Oreg.....	173
Boston, Mass.....	173
Calexico, Calif.....	175
Douglas, Ariz.....	175
El Paso, Tex.....	176
Naco, Ariz.....	176
New Orleans, La.....	176
New York, N. Y.....	177
Nogales, Ariz.....	183
Philadelphia, Pa.....	184
Philippine Islands.....	184
Port Huron, Mich.....	186
Porto Rico.....	186
Quebec, Canada.....	186
Rio Grande and Roma, Tex.....	186
San Francisco, Calif.....	187
Tucson, Ariz.....	189
Immigrants admitted to hospital at New York:	
Nativity and sex.....	178
Race and sex.....	180
Immigrants certified:	
Disposition of.....	183
For trachoma, nativity and race of.....	182
Immigrants deported on medical certificates, races of.....	181
Improvements and repairs at marine hospitals.....	212
Industrial and other agencies, cooperation with.....	31
Industrial hygiene and sanitation:	
Causes of industrial absenteeism.....	27
Chemical and physiological aspect of industrial fatigue.....	26
Comparison of efficiency of various dust instruments.....	29
Cooperation with Government departments.....	30
Cooperation with industrial and other agencies.....	31
Chronic carbon monoxide poisoning.....	27
Cyanogen chloride as a new fumigation gas.....	28
Dust in industry.....	24
Heat hazard in the glass industry.....	30
Illumination.....	25
Illumination surveys in Government buildings in Washington, D. C.....	31
Mercurial poisoning.....	27
Occupational diseases.....	25
Occupational health hazards.....	24

	Page
Industrial hygiene and sanitation—Continued.	
Physical condition of persons engaged in measuring radium emanations	25
Physical examinations of 12,000 workers in various industries	28
Posture in industry	26
Statistical office	28
Studies in ventilation	24
Industrial sanitary code	8
Infant mortality	2
Influenza	7, 9, 14
Statistical studies of mortality from	46
Information by radio, health	199
Information, venereal disease	242
Inspection of aliens. ( <i>See</i> Aliens.)	
Inspection of Government buildings, sanitary	110
Inspection service	282
Insular quarantine. ( <i>See</i> Foreign and insular quarantine.)	
Insulin	10, 62
International commission on zoological nomenclature	59
International conferences and medical societies	159
Internes, number on duty	273
Interstate quarantine, report of division of	65
Activities recommended by the advisory committee on the education of sanitarians and the future of public health in the United States	75
Assistant to local authorities of North Atlantic seacoast cities in trapping and examining rodents	70
Cooperation with State health departments	97
Cooperation with States in water supplies	95
Interstate railroad water supplies	78
Interstate sanitary districts	80
Interstate travel of diseased persons, supervision of	110
Interstate vessel water supplies	79
Measures taken against rats	57
Miscellaneous activities	100
Mosquito control along the Texas-Mexican border	101
Operations of Federal laboratory	63
Plague suppressive measures	65
Quarantine of venereally-infected persons	248
Rural health work	100
Sanitary inspection of Government buildings	110
Sanitary inspections in San Francisco, Calif.	67
Sanitation and medical assistance in the national parks	97
Smallpox outbreak in Detroit, Mich.	110
Supervision of common carriers' water supplies	77
Trachoma eradication work	70
Interstate sanitary districts	80
Interstate traffic:	
Recommendations for the prevention of the spread of diseases in	286
Travel of diseased persons, supervision of	110
Interstate vessel water supplies	79
Interstate railroad water supplies	78
Intestinal parasites, examination for diagnosis of	59
Investigational activities, recommendations for the enlargement of	286
Investigations ( <i>see also</i> Studies):	
Cancer	7, 12, 62
Chemical and physiological aspect of industrial fatigue	26
Clonorchiasis	7, 12
Food poisoning	7, 13
Goiter	7, 13
Influenza	7, 14
Malaria	7, 16
Milk	35
Pellagra	7, 21
Pneumonia	57
Rocky Mountain Spotted Fever	7, 23
Stream pollution	9, 48

Investigations—Continued.	Page
Trachoma.....	57
Tularaemia.....	7, 9, 57
Typhus fever.....	7, 24

## K

Key West, Fla., quarantine transactions at.....	117
---	-----

## L

Laboratory, Hygienic. ( <i>See</i> Hygienic Laboratory.)	
Laboratory report of marine hospitals, table showing clinical.....	210
Lake Sabine district, quarantine transactions at.....	117
Laredo, Tex., quarantine transactions at.....	139
League of Nations, cooperation with the health committee of the.....	63
Lectures of venereal disease division.....	246, 247, 262
Legislation, sanitary.....	197
Legislation pertaining to venereal diseases.....	249
Leprosarium, national.....	4, 213
Leprosy investigation station, Honolulu, Hawaii.....	52
Leprosy, prevalence of.....	120, 138, 141, 146, 147, 161, 164, 177, 186
Library of the bureau.....	284
Lighting and ventilation.....	8
Lighting of school buildings.....	8
Liquors and drugs for vessels and miscellaneous functions, medicinal.....	204

## M

Malaria.....	7, 16
Malta fever.....	9, 57
Marcus Hook, Pa., quarantine transactions at.....	118
Marine hospitals and relief, division of. ( <i>See</i> Hospital division.)	
Maritime quarantine. ( <i>See</i> Foreign quarantine.)	
Measles:	
Increase in cases of.....	1, 9
Prevalence of.....	115, 188, 196
Medical advice by radio to ships at sea.....	213
Medical and hospital supplies, economies in the procurement of.....	206
Medical inspection of aliens.....	166
Medicinal liquors and drugs for vessels and miscellaneous functions.....	204
Medical treatment:	
Coast Guard beneficiaries.....	4
Employees' Compensation Commission beneficiaries.....	4
Veterans' Bureau beneficiaries.....	4
Medicine chest, model ships'.....	213
Meetings with sanitary and scientific associations.....	64
Mental hygiene.....	9, 42
Mercurial poisoning.....	27
Meriden, Conn., studies in silver-polishing dusts.....	25
Milk investigations.....	8, 35
Mine sanitation.....	8
Mines, Bureau of, cooperation with.....	30
Mississippi:	
Venereal disease campaign among railroad workers in.....	237
Work of the venereal disease division with the colored population of.....	244
Missouri, work of the venereal disease division with the colored population of.....	244
Mobile, Ala., quarantine transactions at.....	118
Morbidity reports.....	190
Annual reports.....	193
City reports.....	193
Foreign reports.....	195
Monthly State reports.....	192
State.....	191
Weekly telegraphic reports.....	192



	Page
Morbidity studies:	
Among industrial workers	43
Total in general population	44
Mosquito control along the Texas-Mexican border	101
Table of summary of conditions affecting	109
Mosquitoes, control of breeding of yellow-fever bearing	7
Mount Ranier National Park	99
Muir Woods National Park	100
Mumps, prevalence of	188

## N

Naco, Ariz., immigration transactions at	176
Narcotic drug addiction	9, 58, 63
National Leper Home at Carville, La	4, 213
National Park Service, cooperation with	6
National parks, sanitation and medical assistance in the	97
Negro health week, tenth annual national	244
New Orleans, La.:	
Immigration transactions at	176
Quarantine transactions at	119
United States Marine Hospital at	216
Nevada, child hygiene in	38
New York, N. Y.:	
Immigration transactions at	177
Quarantine transactions at	121
United States Marine Hospital at	218
Nogales, Ariz., immigration transactions at	183
Nomenclature, international commission on zoological	59
Nursing, dietetic, and reconstruction section of the hospital division	219

## O

Occupational diseases, studies of	8, 25
Occupational health hazards	8, 24
Office quarters and buildings of bureau	284
Officers. (See Personnel.)	
Ogdensburg, N. Y., quarantine transactions at	131
Ohio River, reports of pollution of	48
Ohio Valley public water supplies, survey of phenol wastes as affecting	50
Operations, surgical, performed at United States marine hospitals	209
Oral hygiene	8, 37
Oxidation reduction, studies of	59

## P

Pamphlets of venereal disease division	246, 247, 262
Parasites, examination for diagnosis of intestinal	59
Paris, France, service transactions at	156
Pasteurization	8, 35
Pathology and bacteriology, division of	55
Patients discharged from marine hospitals and relief stations, table	234
Patients of each class of beneficiary discharged from marine hospitals and relief stations, table	232
Patients, table showing causes of admission and condition on discharge	228
Patients, table showing causes of deaths in marine hospitals and relief stations	230
Patients treated annually by hospitals and relief stations, table showing number of	220
Pay and allowances of commissioned and enlisted personnel of the Army, Navy, Marine Corps, Coast Guard, and Public Health Service, act to amend the act to adjust the	267
Pay patients and beneficiaries of the Public Health Service	201
Pellagra	7, 21, 47
Permeability studies, Hygienic Laboratory	63
Perry Point, Md., Public Health Service supply depot at	206

	Page
Personnel and accounts, report of division of	266
Acting assistant surgeons	272
Attending specialists	272
Boards convened	274
Collaborating epidemiologists	273
Commissioned medical officers	270
Contract dental surgeons	273
Financial statement	281
Hygienic Laboratory	273
Internes	273
Personnel statement	274
Pharmacists and administrative assistants	274
Public health districts	268
Reserve officers	271
Personnel of service:	
Acting assistant surgeons, number on duty	272
Administrative assistants, number on duty	274
Attending specialists at United States marine hospitals	211
Attending specialists, number on duty	272
Boards convened	274
Classification of field service	267
Collaborating epidemiologists, number on duty	273
Commissioned medical officers, number on duty	270
Contract dental surgeons, number on duty	273
Hygienic Laboratory, number on duty at	273
Internes, number on duty	273
Pharmacists, number on duty	274
Recommendations regarding	287
Reserve officers, number on duty	271
Table showing	275
Transfer of commissioned officers to Veterans' Bureau	266
Personnel statement	274
Pharmacists, number on duty	274
Pharmacology, division of	61
Pharmacopœia, cooperation with the revision committee of the United States	63
Philadelphia, Pa., immigration transactions at	184
Philippine Islands:	
Examination of refugees at immigration station	185
Immigration transactions at	184
Quarantine transactions in	145
Physical examinations at hospitals and relief stations	210
Pituitary standardization	62
Plague:	
Case of human plague in California	3, 66
Changes in quarantine procedure for	112
Infection by ground squirrels	3, 65
Prevalence of	3, 4, 111, 114, 147, 158, 160, 161
Preventive measures in the Philippines	147
Suppressive measures	65
California	5
San Francisco, Calif.	65
Seattle, Wash.	69
Suspension of	3
Pneumonia	9, 57
Statistical studies of mortality from	46
Poisoning, food	7, 13
Pollution of streams	9, 48
Port Huron, Mich., immigration transactions at	186
Portland, Me., quarantine transactions at	131
Porto Rico:	
Immigration transactions at	186
Quarantine transactions in	153
Port Townsend, Wash., quarantine transactions at	131
Post Office Department, cooperation with	30
Posture in industry and its relation to health	8, 26
Prenatal syphilis	236

	Page
Presidio, Tex., quarantine transactions at.....	140
Prevalence of disease. ( <i>See Diseases.</i> ).....	
Prevention of the spread of diseases in interstate traffic.....	286
Progreso, Yucatan, Mexico, quarantine transactions at.....	163
Proteolytic enzymes of bacteria.....	61
Providence, R. I., quarantine transactions at.....	133
Publications:	
Hygienic Laboratory.....	64
Sanitary reports and statistics, division of.....	197
Social pathology.....	244
Venereal disease division.....	242, 245
Public health:	
Administration, studies of.....	32
Districts.....	268
Education, section of.....	198
Summer schools.....	75
Puerto, Mexico, quarantine transactions at.....	163
Purification of water:	
Collective and experimental studies.....	50
Experimental studies of natural purification of streams.....	49
Studies of physical chemistry of coagulation in water.....	50

## Q

Quarantinable diseases:	
Affecting the Philippines.....	147
General prevalence of.....	111
Quarantine. ( <i>See Interstate quarantine; also Foreign quarantine.</i> ).....	
Quarantine laws, violation of.....	113
Quarantine of venereally infected persons, interstate.....	248
Quarantine, outgoing from Philippine Islands.....	149
Quarantine procedure, changes in.....	112
Quarantine services at maritime stations, bills rendered for.....	155
Quarantine service, recommendations for national.....	286
Quarantine stations, reports of transactions.....	113
Aliens inspected and certified. ( <i>See Aliens.</i> ).....	
Baltimore, Md.....	114
Boston, Mass.....	115
Brownsville, Tex.....	138
Columbia River.....	116
Delaware Bay and River.....	116
El Paso, Tex.....	138
Galveston, Tex.....	116
Hidalgo, Tex.....	139
Key West, Fla.....	117
Lake Sabine district.....	117
Laredo, Tex.....	139
Marcus Hook, Pa.....	118
Mobile, Ala.....	118
New Orleans, La.....	119
New York, N. Y.....	121
Ogdensburg, N. Y.....	131
Portland, Me.....	131
Port Townsend, Wash.....	131
Presidio, Tex.....	140
Providence, R. I.....	133
Reedy Island, Del.....	133
Rio Grande and Roma, Tex.....	140
Sabine, Tex.....	134
San Francisco, Calif.....	134
San Pedro, Calif.....	137
Savannah, Ga.....	137
Quarantine stations, report of transactions of insular:	
Hawaiian Islands.....	141
Philippine Islands.....	145
Porto Rico.....	153
Virgin Islands.....	153
Quarantine transactions, report of division.....	111

Quarantine transactions at foreign ports:	Page
Frontera, Mexico	160
Guayaquil, Ecuador	160
Habana, Cuba	161
Paris, France	156
Progreso, Yucatan, Mexico	163
Puerto, Mexico	163
Shanghai, China	164
Tampico, Mexico	164
Tuxpam, Mexico	165
Vera Cruz, Mexico	165
Yokohama, Japan	166
Quebec, Canada, immigration transactions at	186

## R

Radio, health information by	199
Radio medical advice to ships at sea	213
Radium emanations, physical condition of persons engaged in measuring	25
Railroad water-supply supervision ( <i>see also</i> Water supplies)	83, 84, 85, 91, 92
Rat-proofing	5
Rat-proofing of old buildings, measures taken for the permanent	68
Rats, measures taken against	67
Recommendations	286
Reedy Island, Del., quarantine transactions at	133
Relief, chart showing increase in amount of hospital	200
Relief furnished by hospital division, table showing	225
Repairs and improvements at marine hospitals	212
Reporting of venereal diseases	237
Reports of communicable diseases	4
Reserve officers, number on duty	271
Rio Grande and Roma, Tex.:	
Immigration transactions at	186
Quarantine transactions at	140
Rocky Mountain spotted fever	7, 23
Rodents:	
Assistant to local authorities of North Atlantic seacoast cities in trapping and examining	70
Examination at quarantine stations of	115,
	122, 125, 126, 129, 131, 134, 136, 144, 148
Rontgenology	211
Rural health work	100
Rural sanitation	6

## S

Sabine, Tex., quarantine transactions at	134
San Francisco, Calif.:	
Immigration transactions at	187
Plague suppressive measures	65
Quarantine transactions at	134
Rat surveys	67
Sanitary inspections	67
United States Marine Hospital at	216
Sanitarians, activities recommended by the advisory committee on the education of	75
Sanitary code, industrial	8
Sanitary condition in Europe	158
Sanitary districts, interstate	80
Sanitary inspection of Government buildings	110
Sanitary legislation	197
Sanitary inspections in San Francisco, Calif.	67
Sanitary reports and statistics, report of division of	190
Sanitary reports and statistics, division of:	
Annual reports	193
City reports	193
Collaborating and assistant collaborating epidemiologists	190
Foreign reports	195

Sanitary reports and statistics—Continued.	Page
Health information by radio.....	199
Monthly State reports.....	192
Morbidity reports.....	190
Prevalence of disease.....	195
Publications issued by the division.....	197
Sanitary legislation.....	197
Section of public-health education.....	198
State morbidity reports.....	191
Weekly telegraphic reports.....	192
Sanitation and medical assistance in the national parks.....	97
Sanitation:	
Demonstration projects in rural.....	6
Industrial hygiene and.....	7, 24
Mine.....	8
San Pedro, Calif., quarantine transactions at.....	137
Savannah, Ga., quarantine transactions at.....	137
Scabies, prevalence of.....	188
Scarlet fever, prevalence of.....	1, 9, 164, 196
School buildings, lighting of.....	8
Schools of public health.....	6
Schools, public-health summer.....	75
Schools, work of venereal disease division with.....	245
Scientific research, report of division of.....	11
Causes of industrial absenteeism.....	27
Child hygiene.....	37
Cooperation with Government departments.....	30
Cooperation with industrial and other agencies.....	31
Cooperation with Johns Hopkins University School of Hygiene and Public Health in epidemiological study of diphtheria.....	34
Cyanogen chloride as a new fumigation gas.....	28
Diseases, studies of.....	12
Excreta-disposal studies.....	52
Food-poisoning investigations.....	13
Hygienic Laboratory.....	54
Industrial hygiene and sanitation.....	24
Leprosy investigation station, Honolulu, Hawaii.....	52
Mental hygiene.....	42
Milk investigations.....	35
Occupational diseases.....	25
Occupational health hazards.....	24
Public health administration studies.....	32
Statistical office.....	28, 43
Stream pollution.....	48
Social pathology.....	244
Seattle, Wash., plague-suppressive measures at.....	69
Sequoia National Park.....	99
Serums. (See Viruses, Toxins, Serums, and analogous products.)	
Shanghai, China, quarantine transactions at.....	164
Shipping Board, United States.....	204
Ships' medicine chest, model.....	213
Smallpox and vaccination in the Philippines.....	148
Smallpox, outbreaks of.....	2
Smallpox outbreak in Detroit, Mich.....	110
Smallpox:	
Prevalence of.....	2, 3, 5,
111, 114, 116, 118, 123, 135, 138, 142, 147, 148, 154, 158, 164, 165, 183, 197	
Vaccination for. (See Vaccination.)	
Specialists. (See Attending specialists.)	
Specimens examined by the Hygienic Laboratory, table of.....	59
Squirrels, plague infection by ground.....	3, 65
Standardization:	
Biologic products.....	55
Insulin.....	10, 62
Pituitary.....	62
Standards, United States Bureau of, cooperation with.....	30
Stapleton, N. Y., United States Marine Hospital at.....	216
State and Federal appropriations for venereal diseases.....	237

	Page
State laws and regulations on the subject of venereal diseases	248
Statistical office, scientific research division	28, 43
Comparison of efficiency of various dust instruments	29
Course in vital statistics for commissioned officers	46
Heat hazard in the glass industry	30
Morbidity among industrial workers	43
Mortality from influenza and pneumonia	46
Mortality from pulmonary tuberculosis	46
Physical examinations of workers in various industries	28
Statistical technique	46
Total morbidity in the general population	44
Trend of mortality in the United States	45
Work in cooperation with other organizations of the service	46
Statistical technique, studies of	46
Stream pollution	9, 48
Studies. ( <i>See also</i> Investigations):	
Absenteeism from school	8, 39
Antisymphilitic drugs	9, 61
Child hygiene in the District of Columbia	41
Chronic carbon monoxide poisoning	27
Collective and experimental studies of water purification	50
Communicable diseases in children	39
Comparison of efficiency of various dust instruments	29
Cyanogen chloride as a new fumigation gas	28
Dust in industry	24
Excreta-disposal	52
Experimental studies of natural purification of streams	49
Heat hazards in the glass industry	30
Illumination	25
Industrial absenteeism	8, 27
Insulin	10, 62
Lighting and ventilation	8
Malta fever	9, 57
Mental hygiene	9
Mercurial poisoning	27
Mine sanitation	8
Morbidity among industrial workers	43
Morbidity in the general population	44
Mortality from influenza and pneumonia	46
Mortality from pulmonary tuberculosis	46
Narcotic drug addiction	9, 58, 63
Natural illumination of classrooms	8, 40
Nutrition	8, 40
Occupational diseases	8, 25
Occupational health hazards	8, 24
Oral hygiene	37
Oxidation reduction	59
Physical chemistry of coagulation in water purification	50
Physical condition of persons engaged in measuring radium emanations	25
Physical examinations of workers in various industries	28
Pollution of streams	9, 48
Posture in industry and its relation to health	8, 26
Prenatal syphilis	236
Public health administration	32
Statistical technique	46
Syphilis	61
Syphilis in relation to crime and delinquency	237
Trend of mortality in the United States	45
Tuberculosis	9, 57, 63
Ventilation	24
Weight and height of school children	8
Summer schools, public-health	75
Supplies and equipment purchased by the hospital division	207
Supply depot at Perry Point, Md.	206
Surgical operations performed at United States marine hospitals, table showing	209

## Surveys:

Health .....	8
Illumination in Government buildings in Washington, D. C. ....	31
Mentally and physically handicapped children .....	41
Phenol wastes as affecting public-water supplies in the Ohio Valley ..	50
Plague infection among rats in certain New England cities .....	5

## Syphilis:

Chart showing cases reported to State boards of health .....	238, 239, 240
Prenatal .....	236
Relation to crime and delinquency, study of .....	237
Studies of .....	61

## T

## Tables:

Alien passenger inspected and certified .....	170
Alien seamen inspected and certified .....	167
Bills of health issued at quarantine stations of the Virgin Islands .....	154
Bills rendered for quarantine services at maritime stations .....	155
Cases of venereal diseases reported to State boards of health .....	251
Causes of admission for discharged patients and condition on discharge, United States marine hospitals and relief stations .....	228
Causes of death in United States marine hospitals and relief stations .....	230
Clinical laboratory reports of marine hospitals .....	210
Clinical work of the Hygienic Laboratory .....	59
Collaborating epidemiologists on duty .....	191
Common carriers equipped with purification apparatus .....	93
Comparison of conditions affecting mosquito control along the Texas-Mexican border .....	109
Comparison of efficiency of gases (New York quarantine station) .....	130
Comparison of trapping and fumigation at New York quarantine station .....	129
Comparison of the work for the last five years at the Habana quarantine station .....	162
Comparison of the work of 1924 and 1923 at the Habana quarantine station .....	163
Death rate from diptheria .....	196
Dispensary and hospital relief, operations, etc., for trachoma .....	74
Disposition of immigrants certified .....	183
Distribution of cases of sickness among 7,200 persons in Hagerstown, Md. ....	45
Educational work, etc., for eradication of trachoma .....	74
Examination of biologic specimens .....	56
Exhibits, lantern-slides, and films of venereal disease division borrowed or purchased by State boards of health .....	262
Federal allotments and State appropriations for venereal-disease prevention work .....	250
Field operations for the control of ground squirrels .....	66
Hospital transactions at New York quarantine station .....	128
Inspections made by the general inspection service .....	282
Laboratory division transactions at New York quarantine station .....	126
Nativity and race of immigrants certified for trachoma .....	182
Nativity and sex of immigrants admitted to hospital at New York .....	178
Nationalities represented by the aliens arriving at the Philippines .....	185
Number of days in hospital for patients discharged from United States marine hospitals and relief stations by broad groups of conditions and class of beneficiary .....	234
Number of patients of each class of beneficiary discharged from United States marine hospitals and relief stations by broad groups of conditions .....	232
Number of patients treated annually .....	220
Number of persons receiving graduate degrees in public health subjects .....	76
Personnel of the Public Health Service .....	275
Persons or vessels detained or treated .....	113
Plague preventive measures at Seattle, Wash. ....	69
Principal transmissible diseases reported in Habana City .....	163
Quarantine transactions on the Texas-Mexican border .....	137
Race of aliens certified for mental condition .....	183

## Tables—Continued.

	Page
Race and sex of immigrants admitted to hospital at New York.....	180
Races of immigrants deported on medical certificates.....	181
Railroad water supplies.....	79
Record of boarding division at New York immigration station.....	179
Relief furnished at United States marine hospitals and relief stations classified by beneficiary.....	225
Report of clinics for venereal diseases.....	252
Report of medical certificates relating to alien passengers.....	182
Report of medical certificates relating to alien seamen.....	182
Report of service operations in Europe.....	159
Report of venereal diseases in 37 correctional and penal institutions.....	261
Sanitary inspections in San Francisco, Calif.....	67
Specimens examined by the Hygienic Laboratory.....	59
States ranked according to the monthly and daily admissions for vene- real diseases per clinic.....	260
States ranked according to the percentage of increase or decrease in the number of cases of venereal diseases reported to State boards of health.....	252
State report of doses of arsphenamin.....	261
State report of educational activities of venereal-disease work.....	263
Station personnel at New York quarantine station.....	122
Statistical summary of activities in the control of venereal diseases.....	264
Surgical operations performed at United States marine hospitals.....	209
Summary of activities at Port Townsend quarantine station.....	131
Summary of quarantine transactions in Hawaiian Islands.....	145
Summary of quarantine transactions in Porto Rico.....	153
Summary of quarantine transactions at continental and insular sta- tions and foreign ports.....	166
Summary of railroad water supply supervision.....	84
Summary of reports from States health officers.....	195
Summary of work of the rodent laboratory at Boston.....	115
Summary of transaction at foreign ports.....	156
Summary of transactions at insular quarantine stations.....	141
Summary of transactions of outgoing quarantine from the Philippines.....	150
Summary of transactions at Philippine ports.....	146
Summary of typhoid fever cases.....	82
Summary of vessels inspections.....	91
Summary of vessel water-supply supervision.....	83, 94, 97
Summary of vessel work for the year.....	91
Summary of work of Federal laboratory.....	68
Tabulated report of illegal entries apprehended by the quarantine guard at the Texas-Mexican border stations.....	139
Transactions at continental quarantine stations.....	114
Transactions at marine hospitals and relief stations.....	221
Transactions at quarantine stations of the Virgin Islands.....	154
United States marine hospitals, historical and miscellaneous data.....	208
Venereal disease educational pamphlets and placards purchased and reprinted by State boards of health.....	262
Vessel certificates of water supplies.....	80
Work of the laboratory at the San Francisco immigration station.....	188
X-ray report of United States marine hospitals.....	211
Tampico, Mexico, quarantine transactions at.....	164
Tonsilitis.....	9
Toxins. (See Viruses, Serums, Toxins, and Analogous products.)	
Trachoma:	
Eradication work.....	70
Nativity and race of immigrants certified for.....	182
Prevalence of.....	5, 58, 174
Treatment of venereal diseases.....	239
Tuberculosis:	
Miliary, prevalence of.....	175
Prevalence of.....	2, 9, 57, 63, 197
Statistical studies of mortality from pulmonary.....	46
Tucson, Ariz., immigration transactions at.....	189
Tularaemia.....	7, 57
Tuxpam, Mexico, quarantine transactions at.....	165



Typhoid fever:	Page
Prevalence of.....	2, 197
Cases, table of summary of.....	82
Typhus fever, prevalence of.....	3, 5, 7, 24, 112, 115, 123, 140, 158

## U

Uncinariasis, prevalence of.....	187, 188
----------------------------------	----------

## V

Vaccination.....	5
Vaccination and smallpox in the Philippines.....	148

Vaccination:	
At the New York quarantine station.....	124
In the Hawaiian Islands.....	143
Venereal disease campaign among railroad workers in—	
Florida.....	237
Mississippi.....	237
Venereal disease clinics.....	236, 239
Chart showing patients admitted to.....	241
Hot Springs, Ark.....	242
Patients discharged as noninfectious.....	241
Venereal disease:	
Educational pamphlets and placards, purchased and reprinted by	
State boards of health, table showing.....	262
Exhibits, table showing lantern-slides and films borrowed or pur-	
chased by State boards of health.....	262
Information.....	242
Prevention work, table showing appropriation for.....	250
Work, table showing State report of educational activities.....	263
Venereal diseases, report of division of.....	236
Clinics.....	239
Community program.....	243
Correctional and penal institutions.....	241
Court decisions.....	248
Distribution of arsphenamin.....	241
Federal and State appropriations.....	237
Field service.....	243
Interstate quarantine.....	248
Legislation.....	249
Medical instruction.....	242
New publications.....	245
Painphlets, film showings, lectures, exhibits.....	246
Requests for medical advice.....	243
Reporting of venereal diseases.....	237
Social pathology.....	244
State laws and regulations.....	248
Treatment.....	239
Venereal-disease information.....	242
Vice-repressive measures.....	249
Work with schools.....	245
Work with the colored population.....	244
Venereal diseases, recommendations for the control of.....	287
Venereal diseases reported to State boards of health:	
Chart showing cases of.....	238, 239, 240
Table showing.....	251
Table showing States ranked according to the percentage of increase	
or decrease in the number of cases of.....	252
Venereal diseases:	
Reporting of.....	237
State laws and regulations pertaining to.....	248
Table showing report of clinics for.....	252
Table showing report of 37 correctional and penal institutions.....	261
Table showing States ranked according to the monthly and daily	
admissions per clinic.....	260
Table showing statistical summary of activities in the control of.....	264
Ventilation.....	24

	Page
Ventilation and lighting.....	8
Vera Cruz, Mexico, quarantine transactions at.....	165
Vessel certificates of water supplies, table of.....	80
Vessel inspections, table of summary of.....	91
Vessel work for the year, table of summary of.....	91
Vessel water supplies. (See Water supplies.)	
Vessel water supply supervision.....	81, 85, 87, 92, 97
Veterans' Bureau:	
United States.....	4, 204
Transfer of commissioned officers.....	266
Vice-repressive measures.....	249
Violation of quarantine laws.....	113
Virgin Islands, quarantine transactions in.....	153
Viruses, serums, toxins, and analogous products.....	64
Vital statistics:	
Birth rates.....	2
Course for commissioned officers.....	46
Death rates.....	2
Infant mortality.....	2
Trend of mortality in the United States.....	3, 45

## W

Washington County, Md., studies in public health administration.....	33
Water supplies:	
Interstate railroad.....	78
Interstate vessel.....	79
Survey of phenol wastes in the Ohio Valley as affecting public.....	50
Supervision of common carriers'.....	77
Supervision of water used by common carriers in interstate traffic.....	6
Table of railroad.....	79
Table of vessel certificates of.....	80
Water Supply supervision:	
Railroad.....	83, 85, 91, 92
Table of summary of.....	83, 84, 94, 97
Vessel.....	81, 85, 87, 92, 97
Whooping cough.....	1, 9
Wilkes-Barre, Pa., studies in hard-coal dust.....	25

## X

X ray report of United States marine hospitals, table showing.....	211
--	-----

## Y

Yellow fever:	
Changes in quarantine procedure for.....	112
Prevalence of.....	3, 5, 7, 112, 124, 134
Yellowstone National Park.....	98
Yokohama, Japan, quarantine transactions at.....	166
Yosemite National Park.....	98

## Z

Zion National Park.....	99
Zoological Nomenclature, International Commission on.....	59
Zoology, division of.....	59
Zoology, index catalogue of medical and veterinary.....	59

## O







